SOME IRRIGATION SYSTEMS IN ḤAḌRAMAWT

By R. B. SERJEANT

(PLATES I–IV)

How deeply questions of irrigation affect the daily life of the peoples of southern Arabia was first impressed upon me when the summer floods came down to am-Fajarah in Ṣubaiḥī country lying west of Aden, where I happened to be stationed at the time. The villagers turned out to argue, with some violence, over the distribution of the flood-waters. It was, however, as Shaikh Durain,[1] a Lahej official with us in the village, pointed out, without weapons that the villagers had come to the fray, and though the women stood behind, disputing the issue no less fiercely than the men, egging them on, so that all would doubtless have come to blows, men and women alike, there would have been no stabbings or shootings. Shaikh Durain cynically implied that there was more of sound than fury in the rencontre, but of course this is not always so, and disputes arising over rights to the use of water can lead to blood-feuds. Since those days I have made some investigation into irrigation and its wealth of technical vocabulary in various parts of the Aden Protectorate, studying some systems in more or less detail, especially those near Mūdiyah village in Dathīnah.

The territory has a very wide variety of irrigation systems, ranging from the terraced hill-sides of Yāfi' and the Yemen, or other places, to the *qanāts* near Ghail Bā Wazīr, but my inquiries have been mostly concerned with flood irrigation in the *wādīs*, and not into the perennial streams (*ghail*), and only a little into terraced systems. Even where the systems themselves are nearly identical, the technical vocabulary differs from district to district, an important consideration when applying the said vocabulary of present-day southern Arabia to the interpretation of the 'Ḥimyaritic' inscriptions relating to irrigation, since each individual inscription is most likely to be interpreted correctly in accordance with the dialect of the district in which it was set up, given the fact that the population has changed little in composition from the earliest period of Islam.

Water-lore figures quite frequently in folk wisdom, especially that relating to wells. In Ḥaḍramawt one says, *Saiwūn bi-'l-mā' wa-lā saman Shibām* 'Rather water in Saiwūn than ghee in Shibām'. The allusion is to the sulphurous taste of Shibām water so that it is preferable then to live in poverty in Saiwūn than in affluence in Shibām! Of the salty brackish wells of Bōr, 'Abbūd of al-Ghuraf says,[2] *lā yisqūn-ak al-ḥālī*. The type of well found in a village might give rise

[1] *Durain* means 'fox'.

[2] R. B. Serjeant, *Prose and poetry from Ḥaḍramawt*, London, 1951, Ar. text, p. 62, verse 10.

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to a nickname for it. Yet again, the author of *al-Ḥayāt al-sa'īdah* [3] quotes a saying,

إن مطرت والّا سَنَيْنا
(ونحن) إن مطرت والّا بكينا[4]

' If it rains (good) ! Else we water by well.
If it rains (good) ! If not then we weep '.

The allusion is to the *sināwah* when men, women, and animals draw water to irrigate the fields, and the hardness and tragedy of life if rains fail. Snouck Hurgronje has already published an excellent study on the Ḥaḍramī well [5] and it is not with this aspect of irrigation that we are here concerned, but let it be said that water diviners are naturally well known in southern Arabia and that a certain class of miracle in the hagiologies is concerned with discovering water or predicting the arrival of a *sail*.

Irrigation problems constitute an important section of the great *fatāwā* collections in the Yemen, be they Zaidī or Shāfi'ī, and this from the earliest period at which we possess legal works. In the *Kitāb al-Muntakhab* of the first Zaidī Imām [6] there is a section, *Bāb qismat al-mā' baina 'l-ḍiyā'*, on the division of water among (various) holdings/properties. To the Zaidī sources cited by Rossi [7] should also be added *al-Baḥr al-zakhkhār* of Ibn al-Murtaḍā,[8] and of course all the MS Zaidite legal works in the British Museum, the Vatican, the Ambrosiana, and other large collections.

Shāfi'ī legal treatises and *fatāwā* collections are especially numerous and voluminous in Ḥaḍramawt. In the Āl al-Kāf Library at Tarīm I should cite *al-Bayān* of al-'Imrānī [9] and al-Nawawī's *al-Rawḍah* [10]; al-'Imrānī is a well-known medieval Shāfi'ī authority from the Lower Yemen. There are also the

[3] *Al-Ḥayāt al-sa'īdah bi-Ḥaḍramawt*, Singapore, 1953, 4. This was sent me by Saiyid 'Alawī b. Ṭāhir of Johore and might be his own composition. It is reviewed in the Aden paper *al-Nahḍah*. The anonymous author is critical of government activities in irrigation and anti-erosion work on technical grounds, and makes certain proposals of his own.

[4] If the bracketed word which the text includes as a part of the quotation be omitted, the verses are *rajaz* type.

[5] C. Snouck Hurgronje, ' L'interdit séculier (*rifgèh*) en H'adhramôt ', *Revue Africaine* (Alger), XLIX, 256, 1905, 92–9.

[6] See 'Abd al-Khaliq Kazi, *A critical edition of the Kitāb al-Muntakhab fi 'l-fiqh*—a collection of the answers of the Zaidī Imām Yaḥyā b. al-Ḥusain to questions by Abū Ja'far Muḥ. b. Sulaimān al-Kūfī, thesis submitted for London Ph.D., 1957, 171.

[7] E. Rossi, ' Note sull' irrigazione, l'agricoltura e le stagioni nel Yemen ', *Oriente Moderno*, XXXIII, 8–9, 1953, 349–61.

[8] Aḥmad . . . b. al-Murtaḍā, *al-Baḥr al-zakhkhār*, Cairo, 1949.

[9] Abu 'l-Khair, Yaḥyā b. Sa'd b. Yaḥyā al-'Imrānī, *al-Bayān fi 'l-furū'*, cf. Brockelmann, *GAL*, I, 391, Suppl., I, 675. He died in 558/1163 at Dhu 'l-Sufāl. A copy of his *Bayān* is also available in the British Museum.

[10] cf. *GAL*, I, 396.

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fatāwā collections of Abū Makhramah [11] and my MS of Muḥ. b. Ibrāhīm b. Ju'mān [12] but beside these there are many others.

In the late fifteenth or early sixteenth century four well-known questions on water law seem to have been sent to '*ulamā*' abroad from the Shāfi'ī part of the Yemen, though why these should have been well known in legal circles I have not as yet discovered. They run as follows :

١. (سؤال) فيما يملك من المياه المباحة وما لا يملك.
٢. (سؤال) فيما يتعلق بحكم الأراضى التى تسقى تشرب دفعة واحدة.
٣. (سؤال) فيما يتعلق بحكم الأراضى التى تشرب على التعاقب.
٤. (سؤال) فيما يتعلق بحكم انقسام المآء بين الشركآء فى سواقٍ متعددة.

1. Concerning what is possessed of common waters, and what is not possessed.
2. What appertains to the law of lands which are irrigated/drink at one time.
3. What appertains to the law of lands which drink in succession after the other.
4. What appertains to the law of the division of water between partners in various *sāqiyah*-channels.

If my surmise be correct these questions were answered first [13] by Ibn Ḥajar al-Haithamī (*ob.* 973/1565) in a MS which I found in the Āl al-Kāf Library at Saiwūn and which has not yet been reported as existing elsewhere,[14] and by Abu 'l-Ḥasan Muḥammad Tāj al-'Ārifīn al-Bakrī al-Ṣiddīqī (tenth/sixteenth century) in a MS at Batavia [15] of which I have a transcript.

In the Rasūlid kingdom it was the duty of the official known as *mushidd* of a district to look after the '*imārat al-wādī*, i.e. the maintenance of its irrigation works, including barrages (*'uqmah*) of earth and deflectors, details of which

[11] 'Abdullāh b. 'Abdullāh b. Aḥmad . . . b. Ibrāhīm Makhramah al-Saibānī al-Jūhī (1501–2–1564–5) a Ḥaḍramī author ; photocopy in SOAS Library.

[12] He died in 1034/1624–5. Cf. Muḥ. b. Muḥ. . . . Zabārah, *Mulḥaq al-Badr al-ṭāli'*, Cairo, A.H. 1348, 9.

[13] A MS work by 'Alī b. 'Abdullāh al-Samhūdī (*ob.* 911/1505) entitled *al-Anwār al-sanīyah fī ajwibat al-as'ilat al-Yamanīyah* (E. Lévi-Provençal, *Les manuscrits arabes de Rabat*, Paris, 1921, p. 249), I had thought might be another in the same series, but through the courtesy of Muḥammad b. Tāwīt who sent me a microfilm of the MS I have discovered that it does not deal with irrigation but with religious questions.

[14] Numbered Fiqh no. 85, and entitled *al-Ajwibat al-ḥasanah wa-jawābāt Ibn Ḥajar 'an al-as'ilat al-Yamanīyah.*

[15] P. S. van Ronkel, *Supplement to the catalogues of the Arabic MSS preserved in the Museum of the Batavia Society of Arts and Sciences*, Batavia, 1913, p. 292. His son Muḥammad it probably is whose obituary notice appears in Ibn al-'Aidarūs, *al-Nūr al-sāfir*, Baghdad, 1934, 414, under the chronicles for the year 993/1585. He himself figures in a list of Meccan '*ulamā*' including Ibn Ḥajar and several South Arabians, in Ulughkhānī, *An Arabic history of Gujerat*, ed. E. D. Ross, London, 1910–28, II, 637.

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are given, the upper land 'drinking' before the lands lying lower down the *wādī*.[16] One is not to interpret this, of course, as meaning that the *mushidd* carried out this work himself or with subsidies provided for this purpose by the government, but simply that he saw to it that the work was done. The object of the central government was to ensure that there should be no diminution in its revenues through the neglect by the proprietors to maintain their bunds. I have heard it said that the tribal overlords in Ḥaḍramawt in former times were equally insistent that maintenance be regularly effected.

South Arabian historical literature contains many scattered references to irrigation which if collected could supply us with valuable data. As an example there may be cited *al-Nūr al-sāfir* [17] discussing the Ma'rib Dam and the *Sail al-'Arim*:

فبنوا بين الجبلَيْن سدًّا من الصخر والقار ونزل الماء العظيم خارج السد، وجعلت فى السد مشاعب أعلى وأوسط وأسفل ليأخذوا من الماء كلما احتاجوا إليه فحرث داخل السد.

'They constructed a dam of rock and pitch between the two mountains, and the bulk of the water (?) came down outside the dam. They placed in the dam channels, at the top, middle, and bottom, to run off the water whenever they required it, and there was ploughing inside the dam.' I have not read that pitch was used in the construction but lead dowels were certainly employed.

One of Ettore Rossi's last tasks undertaken was to publish his notes on irrigation in the Yemen [18]; these are excellent observations, but a comparison of the technical vocabulary he reports shows that it has little in common with the Ḥaḍramī data below. *Ghail* irrigation, on the other hand, resembles in certain aspects what is known from the Hejaz,[19] and even North Africa where the *ṭāsah* or cup used to measure the flow of water is also in use, for instance, south of the Atlas mountains. Lastly, two valuable theses have also recently been compiled on the pre-Islamic material which should make it easier for comparisons to be made between the existing and the ancient irrigation systems.[20]

[16] *Mulakhkhaṣ al-fitan*, fols. 11 r. and 12 v. Cf. Claude Cahen and R. B. Serjeant, 'A fiscal survey of the mediaeval Yemen', *Arabica*, IV, 1, 1957, 22–33.

[17] Ibn al-'Aidarūs, *al-Nūr al-sāfir*, Baghdad, 1934, 69.

[18] See p. 34, n. 7.

[19] cf. my 'Two sixteenth-century Arabian geographical works', *BSOAS*, XXI, 2, 1958, 257.

[20] A. K. Irvine, *A survey of old South Arabian lexical materials connected with irrigation techniques*, thesis submitted for Oxford D. Phil., 1962; M. A. Ghul, *Early southern Arabian languages and classical Arabic*, thesis submitted for London Ph.D., 1962. For a survey of earlier materials, see A. Grohmann, *Südarabien als Wirtschaftsgebiet*, Brünn, 1933, II, 19–33, 'Bewässerung', but the whole section 'Landwirtschaft' is not irrelevant. A more recent and general survey, Dante Caponera, *Water laws in Moslem countries* (FAO Development Paper No. 43), Roma, 1954, has little specific information on South Arabia.

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Irrigation at Ḥuraiḍah

The valley of Ḥuraiḍah is called the Wādī Tajrūb, but it appears more commonly perhaps to be known as 'Aibūn, the latter name alone figuring on von Wissmann's map. Its flood-water would run into the main *wādī*, 'Amd. It might be observed at this point that two kinds of *misyāl* or flood-bed (and no doubt many more) are distinguished. The first is a *raḥbah* (pl. *riḥāb*), described as a *majrā al-mā'* ' covered with stones ', a Daw'anī word.[21] This is to be compared with the ancient place-name Urḥūb [22] which appears in the *Kitāb al-Muḥabbar*.[23] The second kind, a *ḥidbah*,[24] is a water-course without a stony bed. Both words give rise to place-names, and my impression is that they are not confined to the Wādī Daw'an. At Ḥuraiḍah irrigation is confined to flood-water, since the wells are far too deep to provide water for irrigating the fields. The flood is deflected from the *wādī* down a *sāqiyah*-channel to the fields. The 'Aṭṭās Saiyids of Ḥuraiḍah sketched out for me two patterns of field-irrigation (figs. 1–2), not, of course, scale drawings, nor do they attempt to portray any particular field lay-out, although I surmise my informants probably had certain fields in mind, for the composite aerial view of Wādī 'Amd published by Miss Caton-Thompson [25] does seem to show, just above and to the south of Ḥuraiḍah, something resembling the field-patterns here.

To consider first the more elaborate field-pattern (fig. 1), there is at the head of the *sāqiyah*-channel deflecting the flood-water from the *wādī*, known as *rās al-sāqiyah*, and before the water enters the field, a little hole known as *minkī*, usually filled up with loose stones, etc., which can be opened up to divert the water and stop it flowing into the field area should this have taken sufficient water. In front of the actual entrances into the fields a stone apron, in a sort of rough cobbling, called *raṣa'ah*, is built into the *sāqiyah*. In Saiwūn such an apron of stones is called *raḍīk̲hah*, be it in front of the *maqāsim al-mā'*,[26] the channels leading off the water to various gardens, or in front of a gate. In Saiwūn the *maqāsim al-mā'* are constructed in stone, the stone floor or step between being called, it was said, a *raḍīk̲h* (fig. 3).

The divisions at the openings to the fields are made with great precision so that the flow of water into them is very accurately controlled. They seem to have special technical names. A *bidd* (pl. *budūd*) [27] is an open channel, masonry-lined, into a field, the word being used in Tarīm and elsewhere. A plank (*sufrah*), normally lying on the bank by the place where it is to be

[21] *Al-Ḥayāt al-sa'īdah*, 8. Irvine, op. cit., 253, quotes *rḥbm* from C540 as a proper name, but it could be taken in the sense given here.

[22] cf. the form Uk̲hdūd, *BSOAS*, XXII, 3, 1959, 572–3.

[23] A. F. L. Beeston, ' The so-called harlots of Ḥaḍramaut ', *Oriens*, v, 1, 1952, 17.

[24] A *ḥaḍbah* was said to be a *qārah* (prominence) *aw bilād ṣaġ̲hīrah*.

[25] G. Caton-Thompson, *The tombs and moon temple of Hureidha*, Oxford, 1944, plate I. See also pp. 9–16, ' Ancient irrigation in the Wādī 'Amd ', and pl. LXXII.

[26] See *Bibliotheca geographorum Arabicorum: indices, glossarium*, Leiden, 1879, 325, for *maqāsim al-mā'*.

[27] In Sa'īd of Upper 'Awlaqī territory (Wādī Yas̲hbum), *bidd* (pl. *bidād*) is a channel.

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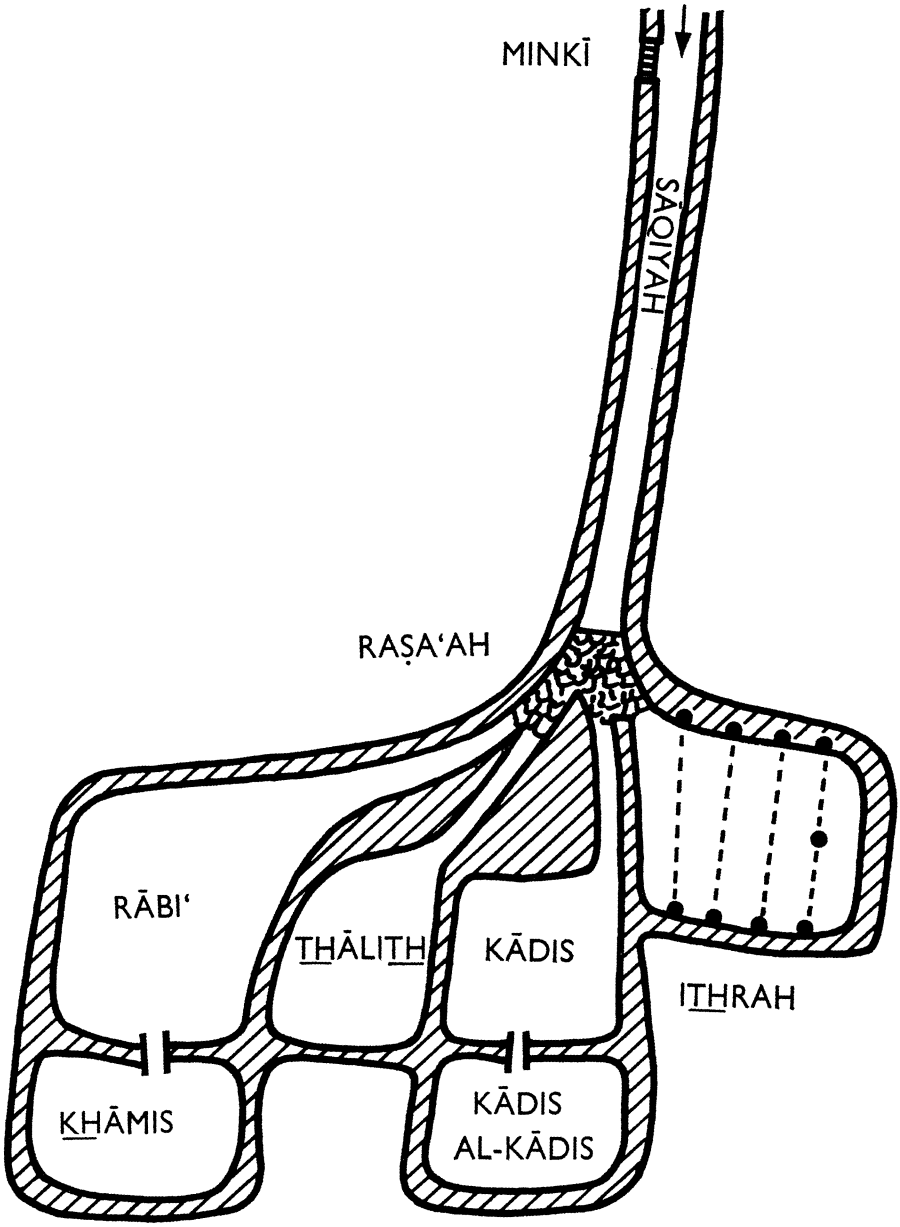

FIG. 1. A *sāqiyah* leads to the fields, with a *minkī* at the upper end which can be opened to allow surplus water to spill away. A stone-paved *raṣa'ah* lies at the openings on to the fields, each of which has its own name in the series. The *ithrah*-field is shown as divided into strips belonging to several different persons; these are marked by stones (*awthān*) set in the clay bund (*sawm*). These strips are called *khars*.

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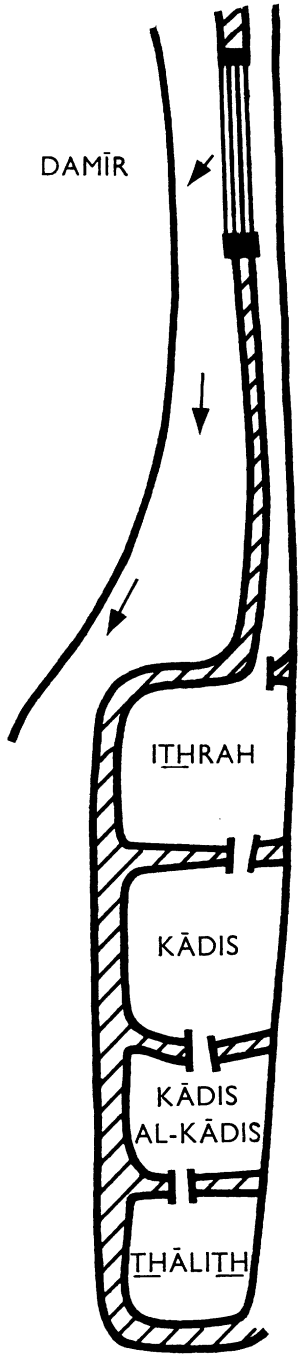

FIG. 2. A *sāqiyah* leads to the fields with a stone *ḍamīr* or barrage, possibly like that shown in Caton-Thompson, op. cit., pl. II, over which water surplus to the fields' requirements will spill and be led to fields lower down the *wādī*. The fields from the *ithrah* to the *thālith* ' drink ' in sequence. A cutting is shown in the lower bank of each field, but its exact location would depend as to where it is most suitable to cut without causing damage or loss to either field.

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employed, is inserted into the *bidd* when it is desired to stop the flow of water into the field, being fitted into grooved projections (*ṣadāwid*) (fig. 4) in the *bidd*. When in full spate this is quite a difficult, even a dangerous task. A *ḥarrah* (pl. *ḥirār*) is a channel with, as it were, a kind of stone bridge over it (fig. 5). At Ḥuraiḍah all works such as the *bidd* or *ḥarrah* appear to be plastered with *nūrah* or held together with some sort of cement ; they are *marṣū' bi-'l-ḥajar*,[28] revetted

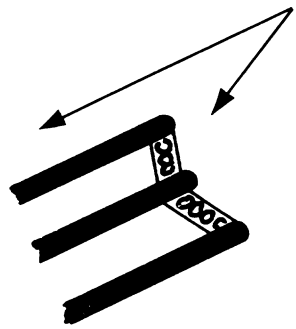

FIG. 3. The stone heads of the deflector channels (*sās*) leading from the flood-course, with a stone-paved *raḍīkh* running across the entrance to each channel to prevent erosion.

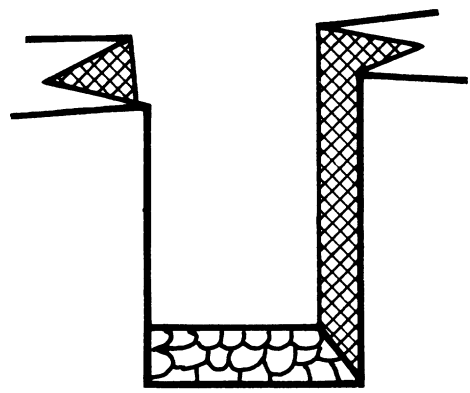

FIG. 4. Grooved projections (*ṣadāwid*) into which the sluice-plank fits, at the entrance of fields.

with stone, which is described as *al-ḥajar al-mugharraq bi-'l-nūrah*, stone overlaid with plaster.

The nature of the terrain conditions the number of fields which can be irrigated by any one *sāqiyah* ; in this case there are six, and the order in which they would ' drink ', as Arabs say, is as follows :

1. The *ithrah*.
2. The *kādis*, from which the flood flows into the *kādis al-kādis*.
3. The *thālith*, lit. ' third ', in order of ' drinking ' presumably.
4. The *rābi'* ' fourth '.

[28] cf. *marṣad* in p. 54, n. 73, and *ḥarrah* in *al-Shāmil*, 203.

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5. The *khāmis* ' fifth '.
6. The *sādis* ' sixth ', also called *khadūd*.[29]

My notes unfortunately do not state precisely whether the *kādis al-kādis* is the same as the *sādis/khadūd*, though I think not, but it was affirmed that the *kādis al-kādis* drinks last of all the fields in this lay-out. The reason put forward is that the current is still strong when it comes to the second and third fields, but it is weak when the flood-water is turned to irrigating the fourth and fifth fields, and it is only when it has weakened a bit that the sixth field is allowed to ' drink '. I imagine this may be for one reason or another, or even both—namely that it is axiomatic that the higher ground ' drinks ' first in all systems known to me and the *kādis al-kādis* must lie below the level of the *kādis*, or else because a cut in the bank of the *kādis* while the flood is still violent might lead to the

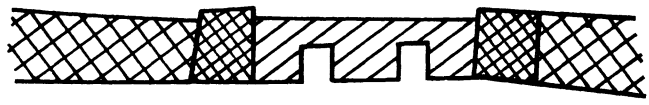

FIG. 5. A *ḥarrah* or stone bridge over the entrance for flood-water to a field.

erosion of the *kādis* into the *kādis al-kādis*. At Tetuan in Morocco I chanced to learn that the word *kaddūs* means a water-pipe, though this may only be a coincidence.

In Dathīnah where the banks or bunds of the fields are of clay in the systems that I studied, the owner of a field lying below another has the right to cut into the bund (*sawm*) of the upper field to water his own field. This right is of course subject to certain defined conditions which form a part of the customary law of the district. Some fields in Dathīnah, however, simply have a *takhrīj* made of stone, an exit over which the surplus water can spill and run away. In Ḥuraiḍah they have correspondingly a *mithwā* or *mansam*, the height of which was stated to be a *dhirā'* or a *dhirā'* and a half (approximately 18 or 27 inches). I have not recorded whether these are merely places in the clay bank, or whether they are made of stone. *Mansam* has, linked with it, a verb, *yinassim-uh* ' he opens it up ', so it may be merely of clay. I have also noted that the local name *faqīyah* seems to be more or less equivalent to the Dathīnah *maqṭa'* and that it is usually covered with clay (*marbūdah*) ; one speaks also of a *fatḥah marbūdah*, an opening covered with clay, from the verb *rabad, yarbad*.[30] Where there is a *minkī*

[29] cf. p. 37, n. 22. This word appears as a name on von Wissmann's map, near Ḥuraiḍah. In Dathīnah a *khudād* is a sort of furrowing in the ground made by a *sail*, always long-wise of course, a synonym of which is said to be *washar*, a ' sawing, saw-cut ' as it were.

[30] Landberg, quoting Hein, denies that the latter's assertion that *marbadah* means *siqāyah* is correct, but I think Hein is probably right, except that it may conceivably be so named because *siqāyahs* are covered with *nūrah* which makes them conspicuous. I think *rabada* should be taken as equivalent to *rabaṭa* ' to bind or tie ', and consider that the Ḥaḍramīs regard the *fatḥah* as bound together with clay. In Tarīm *rabad* means to close the breach of a clay bund (*sawm*) to make it hold water.

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at the head of the *sāqiyah* channel, however, some systems at Ḥuraiḍah have no *mi<u>th</u>wā* since the surplus water can be diverted before it reaches the fields, and thus probably the risk of erosion will be lessened. A *ma'<u>dh</u>ar* is an emergency opening in a bank, filled with stones until it happens to be needed. The stone filling is then removed, if, for instance, the banks are in danger of being washed away, and the water is allowed to flow through it. It is a bound masonry channel.

A single field may belong, for instance, to ten persons, as in the case of the *i<u>th</u>rah* in fig. 1. Each of these may perhaps in turn divide his share into *maṭā'ir* (s. *maṭīrah*)[31] or plots, each separated from its fellows by a small bank (*ma<u>gh</u>mas*). This *ma<u>gh</u>mas* is covered by water at flood-time. The act of dividing the field among several owners is known as *ta<u>kh</u>rīs*, and each strip as a *<u>kh</u>ars*. Landmarks (*aw<u>th</u>ān*),[32] stones or little heaps of small stones,[33] are set in the actual bund (*sawm*) to show how each individual strip of land runs. Sometimes a strip may be divided down the middle into two halves, called *yaks* (pl. *yukūs*), by a mark (*'alam*) known as a *qāri'*. I have recorded the phrase, *yarudd yiqra' ṣāḥib al-yaks*, probably meaning that the owner of the *yaks* may further subdivide the strip with a *qāri'* mark. In this last case the crop is sown, and at harvest time one man stands at each end of the field where the boundary stones are, and another walks between them—their three heads must be kept in line, and the middle man scores the ground to indicate where the dividing line should be made in the crop. The distance between bund and bund is known as *<u>sh</u>aḥb*.

In order to allow the *i<u>th</u>rī/i<u>th</u>rah* to 'drink' first, the other channels are stopped up with stones, this filling being known as *ma'<u>sh</u>ā* (verb, *ya'<u>sh</u>awna-hā* 'they stop up the channels with stones'), but these stones are removed from the *kādis* channel when it is time for it to 'drink'. The other fields drink in sequence. One single 'drinking' of a field is known as *ziḥī*, but this term may be applied to the first and to the second 'drinking'.

If the first field to be irrigated with flood-water is arable soil (*ṭīn*) only, i.e. contains no palm trees, then you give it *mā' qaṣab-ah* only, lit. 'the water of its stalk', and no more, for otherwise this would damage the *qaṣab*, i.e. millet-stalk which, of course, forms the staple animal fodder of the country.

[31] The *maṭīrah* (in Tarīm 21 *<u>dh</u>irā'* square) is probably of an extent more or less fixed over all Ḥaḍramawt. 'Alawī b. Ṭāhir, *al-<u>Sh</u>āmil*, 173, discussing a certain *maṭarah*, apparently a large basin (*ḥawḍ*) which fills with water at flood-time, states its area in *maṭīrahs*, adding that the *maṭīrah* is 49 *<u>dh</u>irā'* square (nearly 79 feet); this measure relating presumably to the Wādī Daw'an. The *Tarjī al-aṭyār* of 'Abd al-Raḥmān b. Yaḥyā al-Ānisī al-Ṣan'ānī, ed. al-Yaḥṣubī and al-Fā'i<u>sh</u>ī (Cairo, A.H. 1369), 234, makes *al-maṭīr* equivalent to *al-mamṭūr*, quoting a verse *wa-lā zāl maṭīr*.

[32] cf. Rossi, 'Note sull' irrigazione', 359; Landberg, *Arabica*, v, Leiden, 1898, 146 seq., and *Gloss. da<u>t</u>*. A legal text I saw in Mūdiyah contains the phrase حول مقسوم بين شخصين متميّز بالأوثان. This perhaps may be read *ḥawl* with *Gloss. da<u>t</u>*., in the sense of a rain torrent, but Lane gives *ḥiwal* as a furrow or trench in the ground in which palm trees are planted. A Kibsī *saiyid* told me that a *ḥawl* simply means a *jirbah*, a field, and is still used in this sense in the Yemen.

[33] On the Jōl west of the Wādī Daw'an, Bedouin called a small heap of stones, approximately a foot high, where several paths branched off, a *kūt*; it had been made to indicate the correct path.

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The *ḥazar*, explained as *qadr irtifā' al-mā'*, the height of the water (at its maximum), is a *dhirā'*, approximately 18 inches for *qaṣab*. The water can then be diverted to the next field which might contain palms (*nakhl*); these would be given water in accordance with the height of the *sawm* or bund and its ability to retain the water.

A less complicated lay-out of fields is shown in fig. 2. At the top of the *sāqiyah* channel there is a *ḍamīr* [34] or barrage made of stone along one side of the channel. Clearly if the flood-water rises to the height of the *ḍamīr* it will spill over the top of it and be led away to another group of fields or go to waste. The flood-water required for the fields in the diagram would, however, pass down the *sāqiyah* and water the *ithrah*, then the *kādis*, and so on, each of these fields in sequence, the level of each field being somewhat lower than the field preceding it. To judge by Dathīnah, the point of exit of the flood-water from one field to the next would be selected in accordance with the terrain, and in Dathīnah if the flood-water were only sufficient to irrigate the top field, the others would not drink. This is likely to be the same in Ḥuraiḍah.

The 'Aṭṭās Saiyids told me that if people are afraid of excess water coming into a group of fields they take the stones out of the top course of the *ḍamīr* (*yunaiyiqūn al-ḍamīr*) which might be about 20 *dhirā'* (approximately 30 feet) across. The course of stones is called *ḥabl* in Ḥaḍramawt, and it is a word known also to ancient southern Arabia.[35] This causes the water level to be lowered and it does not rise to the fields they wish to protect. There is a saying, *al-maksar fi 'l-ḥajar mā yaḍurr* 'damage to the stone is of no account'. The meaning of this maxim is that the stone barrage is easily repaired, but if the water attacks the soil (*ṭīn*) it scoops it out (*yajruf-uh*), i.e. erodes it, and this causes great damage, one might add in extreme cases, irreparable damage.

Where water is likely to scoop out or erode a clay bund (*sawm*) it is given

[34] Landberg, *Ḥaḍramoût*, Leiden, 1901, 184, gives a plural *ḍumur*, and describes it as a 'digue transversale pour faire entrer l'eau dans les champs'.

يبنوه بالحَجَر والنوره على عُرْض الوادى على شان الماء يَعْشِى وُيطْلَع بذَبر البلاد.

I have recorded a plural *ḍumūr*.

[35] cf. G. Ryckmans, 'Sabéen *ḥbl* = accadien *abullu* ?', *Archiv Orientální*, XVII, 2, 1949, 310–12. This article discusses a brief inscription, 'sur une grande pierre faisant partie des assises extérieures des grands temples de Ṣirwāḥ', from the Yemen. Ryckmans proposes that *ḥabl* is a term of construction equivalent to the Akkadian *abullu*, i.e. a large door, gate. Muḥ. b. Abī Bakr al-Shillī, *al-Mashra' al-rawī*, Cairo, A.H. 1319, I, 127, discusses a well known as al-Bīr al-'Alawīyah at Bōr dug by a celebrated Saiyid who طواها بحجارة كبار وكتب اسمه على كل حجارة من الحبل الأعلى وهو المدما 'lined it with large stones and inscribed his name on every stone of the top-most *abl*, which is the *midmāk* (vocalization dubious)'. Lane gives *dumlūk* as applied to a stone in the sense of 'smooth, even'. At Sa'īd of Yashbum it seemed to be the name of the two facing walls of a stone deflector, with a core of earth or rubble, this filling known locally as *wajlah*. The workmen called these two walls *ḥablain* (fig. 6). They used a sledge (*'ishshah*) to carry the stone for the work, and the usual palm-leaf baskets for conveying the *wajlah*. Clearly this sense fits the phrase of *CIH*, 343, 5 *'dy ḥblthmw w'brthmw*. Cf. the discussion by G. Ryckmans, 'Epigraphical texts', in Ahmed Fakhry, *Archaeological journey to Yemen*, Cairo, 1951–2, II, 2. The Ḥaḍramī author

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a stone revetment or facing called a *ḍil*' ; one says *yiḍla*' ' he makes a *ḍil*' (revetment) '.[36]

A burst in the clay *sawm* or bund is known as a *hajīyah* (fig. 7) ; this is repaired by building a clay bank round it, the shaded portion of fig. 7. *Ṭawl* is the flowing of water over the top edge of the bund, thus damaging it, and *ghawl* is a sort of burrow in the bund through which the water enters the bank to destroy it. When this happens the owner of the field shouts out, *Yā fulān,*

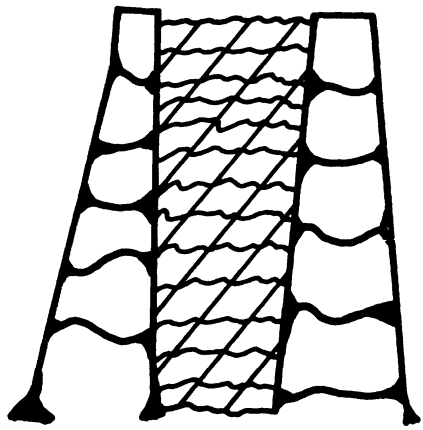

FIG. 6. Stone deflector (cross-section) at Sa'īd, two external masonry walls (*ḥablain*) with a rubble core (*wajlah*).

yā fulān, maksar ! maksar ! ' Oh, so-and-so, a break ! a break ! ' Those addressed all come and help him to repair it. *Ṭawl wa-ghawl* would form the sort of cliché in which Arabic delights and abounds. It is in Ḥaḍramawt part of share-cropping contracts that the cultivator should *yarudd al-makāsir* ' repair the breaks '.

Silt is brought down by all the floods, known as *ṭafal*, *ṭamī*, *ghirain*, *gharyal*, according to the author of *al-Ḥayāt al-sa'īdah* [37] though he does not specify

of *al-Mashra'* evidently understands the word as a course of stones, but the sense in Yashbum is a little different. In the Tarīm area it was used of a course of stones in a barrage. *Al-Mashra'*, I, 141, alludes to *shafīr al-bīr*, the ' lip ' of the well. According to *al-Shāmil*, 177, the Ḥaḍramīs excavate for the foundations of a house until they come to the *nudūwah* or damp earth. They then lay the stone foundation, course (*ḥabl*) upon course, the lowest course being called *ḥabl al-nudūwah*.

[36] See p. 51.

[37] *Al-Ḥayāt al-sa'īdah*, 1953. *Ghirain* is a word cited also in Muḥ. 'Alī Luqmān, *Qiṣṣat al-dastūr al-Lahjī*, Aden, 1952, 7. W. S. Blackman, *The fellāḥīn of Upper Egypt*, London, 1927, 146, records *ṭafl* as a yellow clay used as slip in the Nile valley. This silt is no doubt beneficial to the ground, since in Ḥuraiḍah the earth is cut up and *ṭifil* (colloquial pronunciation) is used instead of dung. Dung is not used in Ḥuraiḍah because of its heat except in places frequently watered. In the Yemenite *Bughyat al-fallāḥīn* (see p. 46, n. 44) there are many instructions for the application of dung to the soil, and human excrement is even sold for this purpose in some of the larger towns of Ḥaḍramawt.

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in which districts these words are current. In reviewing [38] Bowen's article on 'Irrigation in ancient Qatabân', actually at Baiḥān, I have suggested that this silt which is piled up at the sides of fields to keep them at their existing level may, in many cases in South Arabia, have raised the area of the bunds to a point where it is no longer economic to continue cultivating the ever shrinking piece of land, hence abandoned irrigation systems may have been the result of silting rather than neglect or political disturbance. The action of piling the earth deposited on the surface of the field by the flood-water on the bunds is called *ṭarḥ*, and the bank where it is deposited is known as *ḥawmil*.

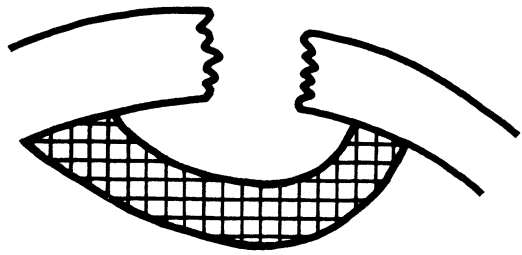

FIG. 7. A *hajīyah* or burst in the clay bund or *sawm* showing a repair bank (shaded).

Each man knows which is his own *ḥawmil*, but this is an issue upon which disputes sometimes occur. No earth may be deposited on a bank of a *sāqiyah*-channel. The reason for this rule seems to me obvious, namely that if it falls into the channel in any way the latter may become silted up and be raised to a level where it is too high for the water to irrigate the fields, thus causing expense to clean it out which would of course fall on all proprietors of fields watered by the *sāqiyah*.

On Pemba Island I was shown several Ḥaḍramī MSS by Saiyid Hādī b. Aḥmad al-Haddār of Āl al-Shaikh Bū Bakr b. Sālim, one of which mentioned *ḥaithat al-sāqiyah*, and the verb *ḥaiyath* which was explained to me as *akhadh al-turāb/al-ṭīn* 'to remove the new earth', and equivalent to the word *al-ṭarḥ*, would be the phrase that occurred in the same MS, *ilqā' ṭīn al-ḥaithah bi-'l-arḍ*. One says *ḥaiyath al-nakhlah* 'he removed the new earth from (the roots of) the palm'. I do not know if these terms are also current in Ḥuraiḍah.

In Ḥuraiḍah they mentioned two kinds of soil to me, *ṭīn*, the word always used for cultivated land or the soil of that land from early times,[39] *zibr* [40]

[38] R. LeBaron Bowen, Jr., and F. P. Albright, *Archaeological discoveries in South Arabia*, Baltimore, 1958, 43–88, reviewed in *BSOAS*, XXIII, 3, 1960, pp. 582–5. Cf. the article '*Ukhdūd*' cited in p. 37, n. 22. An Aden paper, *al-Janūb al-'Arabī*, no. 164, p. 9, speaking of Shibām, refers to طرح التطيور على السوافح الواطئة which might mean placing the spoil at the side of the field.

[39] e.g. in the *Sīrah* of Ibn Hishām, cf. *BSOAS*, XXI, 1, 1958, 3.

[40] *Zibr* is pronounced *zabr* in Dathīnah where it was explained to me as *turāb*, but there also a *zabīr* is a mass of earth like a *sawm* or bund.

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which is *al-ṭīn al-rakẖū ila 'l-bayāḍ aqrab*, soft soil nearest white (in colour) with no sand in it, and *al-jidfir*,[41] which is *al-ṣulb* [42] *al-māyil ila 'l-ḥumrah*, hard inclining to redness. *Shaḥmah* is the word employed in Ḥaḍramawt, certainly in Tarīm and Saiwūn, to mean ' good soil ' or perhaps the goodness in the soil, and in *al-Ḥayāt al-sa'īdah* [43] occurs the phrase *al-suyūl . . . qad jarafat shaḥmata-hā* ' the floods have eroded its good soil '. The phrase *ishtallat al-shaḥmah ḥaqqat-hā* ' the good soil of it has been carried away (by the flood) ' is commonly employed. Certain information is supplied by the medieval Rasūlid monarch al-'Abbās b. 'Alī b. Dā'ūd al-Ghassānī in the *Bughyat al-fallāḥīn*,[44] on Yemenite soils, though much of what he says is repetition of Ibn Baṣṣāl, and it is only his Yemenite observations that would concern us.

When the flood-water comes down the *wādī* at night all the village turns out with lamps to work—a lively scene, especially if it be a *sail hamīm*,[45] a powerful, strong, and noisy flood. Saiyid 'Abd al-Raḥmān laughed at Saiyid 'Alī b. Sālim al-'Aṭṭās because of his tremendous and admirable activity on such occasions, and his fearlessness of the floods. If a man cannot get at his fields, or if he is cut off by the flood from them, or for any other reason, then those already on the spot look after the control of his water, without payment. At Ḥuraiḍah co-operation in such labours is almost a duty, especially when it comes to inserting the sluice-plank (*sufrah*) in the openings to the fields or to removing it. This compares with the customary law of the fisher-folk of the coast where a range of emergency duties must be executed without recompense. Similarly in the event of fire (*ḥarīq*) at Ḥuraiḍah—which often breaks out about the time the *dhurah*-cane (*qaṣab*) is stored in the houses, all turn out to help extinguish it,[46] fetching from their houses whatever water is to hand, in pots, *zīrs*, etc., and the *jābiyah* (cistern) [47] of the mosque is opened to supply water

[41] Many places in Ḥaḍramawt are called al-Jidfirah/Jidfarah. Cf. H. v. Wissmann and R. B. Serjeant, ' A new map of southern Arabia ', *Geographical Journal*, CXXIV, 2, 1958, 168, ' a stratum of good hard clay without sand '. *Al-Ḥayāt al-sa'īdah*, 14, says that *jadāfir* (pl.) are wide open places like desert tracts (*ṣaḥārā*), they being cultivated places from which the course of the *wādī* has descended, so they have become dried up and hard. Cf. *al-Shāmil*, 170. Raḥaiyam explained *jidfarah* as *al-nukẖr/nukẖur* (cf. p. 71, n. 158), and as الطين الصلبه الذى فجّرها الماء من السيل.

[42] cf. Rossi, ' Note sull' irrigazione ', 359, *ṣulbī* ' terra non coltivata '.

[43] op. cit., 12.

[44] In addition to my transcript from Tarīm two copies are available in the Dār al-Kutub though not in the printed catalogues. Cf. Max Meyerhof, ' Sur un traité d'agriculture composé par un sultan yéménite du XVe siècle ', *Bulletin de l'Institut d'Égypte*, XXV, 1943, 55–63, and XXVI, 1944, 51–65. Many passages in the text can correct or improve *Ibn Baṣṣāl, Libro de agricultura*, Tetuan, 1955, ed. and trans. by J. M. Millás Vallicrosa and Mohamed Aziman, a source upon which the *Bughyah* draws extensively. I am indebted to Fu'ād Saiyid for information on the existence of the two Cairo copies.

[45] *Al-Ḥayāt al-sa'īdah*, 14. *Hamīm* was stated to mean a flood that *yahumm* ' makes a noise ', cf. *Gl. dat.*, ' gronder ', of a torrent. It is described in *al-Ḥayāt* as being destructive. In Aden one speaks of *al-dardashah ḥaqq al-sail*, the flowing noise of a flood, or a perennial stream (*ghail*).

[46] For corporate organization to deal with fires, see *Prose and poetry*, preface, 27.

[47] Aḥmad b. al-Ḥasan . . . al-Ḥaddād, *al-Fawā'id al-sanīyah*, fol. 104v., cites a word مباضى as meaning *jawābī* (pl. of *jābiyah*). *Mayāḍī* (s. *mīḍā'*) should probably be read.

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to put out the fire—all this because the wells are so deep that the delay in obtaining water in sufficient quantity would be too great for it to be of any avail against the spread of the fire. In cases where an old man has an irrigation channel choked by silt at the flood-time, all come and help to clear it for him.

People may select a *rā'iḍ* [48] *al-mā' alladhī yir'aḍ al-mā'*, a man who distributes the water. They may not perhaps choose this water-man from among themselves, but take an outsider. He keeps the *sawms* or bunds from breaking, and attends to everything at the time of the watering of the fields. Thus one person only, may look after the watering of the *jirbah* or field, even if it be divided among several. In return for this work he has the right to the *rumām*, grass [49] and other growth of the *sāqiyah*-channel.

With the term *rā'iḍ* one may compare the word *mir'āḍ* which I heard in Tarīm, with the synonyms *mizyāb* [50] and *khārūr*, a baked clay irrigation spout or drain, described to me in Arabic as *majrā ḥaqq al-mā'*, and used to carry water from one *maṭīrah*-plot to another.[51] Other informants seemed to imply *mir'āḍ* was used for draining the rain off buildings only, as indeed *mizyāb* would be applied. My MS copy of the *Manāqib* of Bā Hārūn [52] alludes to the *khuluṣū al-mir'āḍ* [*sic*] ' hole of the water-spout ', leading out of an upper room. In Saiwūn *khuluṣ* (pl. *akhlāṣ*) are holes in a garden wall for the flood-water to enter and irrigate it, to be compared with Rossi's *manfas*.[53] A *ṣalīf* is a little opening in a clay bank of a *maṭīrah* to allow of the passage of water from one *maṭīrah* to another, this word being recorded from Tarīm though it is probably widely used. A small pottery spout to enable water to enter the *ḥufrah* or circular runnel round the roots of a palm tree is called *qarā* (pl. *qiryah*) [54] in Tarīm.

When the dam or deflector (*ḍamīr*) has been broken by recent floods at Ḥuraiḍah, a drum is beaten each night to announce what the peasants are to bring next day in order to work upon the repairs of it. This is called the *taṭrūbah*, and has the sense of ' proclamation ', but it is used, in my experience, especially amongst the tribes in South Arabia for summoning the tribesmen in time of

[48] cf. Landberg, *Ḥaḍramoût*, 163, *ra'aḍ*, ' faire dévier l'eau du *sêl* dans les champs '.

[49] *Gloss. daṭ.*, ' foin '. The word is known also to Lane.

[50] cf. also ' Building and builders in Ḥaḍramawt ', *Le Muséon*, LXII, 3–4, 1949, 283. Cf. *al-Nūr al-sāfir*, 252, *'imārat mīzāb al-raḥmah min al-bait al-sharīf*, i.e. the repair of the rain-water spout of the Ka'bah.

[51] The Yemenite plot called *qaṣabah* (pl. *qaṣab*) is apparently the same as *libnah* (pl. *liban*), a plot of land 12 *dhirā'* square. One says, *Bā nasīr nihbil buq'ah* ' We're going to go and measure out a piece of land '. In the Lower Yemen *libnah* is also known as *shaklah*. Rossi, op. cit., 359, reports much the same. Cf. the section on *masāḥah* in the Ambrosiana MS no. 112, *Rivista degli Studi Orientali*, III, 1910, 908. My ' Star-calendars and an almanac from south-west Arabia ', *Anthropos*, XLIX, 3–4, 1954, 450, also has some names for fields and irrigation-works.

[52] My acephalous MS, fol. 62r., perhaps to be identified as *Uns al-sālikīn*.

[53] op. cit., 358.

[54] *Al-Ḥayāt al-sa'īdah*, 11, alludes to *tanānīr qi'ār al-nakhl* at Baḥrān. *Qa'r* (pl. *qi'ār*) seems to mean a dead palm trunk, and a *tannūr* is a large earthenware jar in the bottom of which a fire is lighted and flapjacks cooked on the warm interior sides. In this context it might mean some sort of pot in which a young palm had been planted, but this is surmise. This would be different from the *qarā*. Cf. *Lisān al-'Arab*, *qarīy*, *majrā al-mā' fi 'l-rawḍ*, *majrā al-mā' fi 'l-ḥawḍ*.

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war, etc.[55] Everywhere in southern Arabia, to the best of my knowledge, a channel or deflector bringing water to a number of proprietors must be maintained at the expense of them all. At Ḥuraiḍah each peasant works on the *ḍamīr*, but should he not for any reason, he will pay instead his contribution towards the cost of the operation, at the rate of 10 East African shillings per 100 *maṭīrah*-plots to be watered. The *ujrat ṣalāḥ al-wādī*, cost of repairing the *wādī*, also known as *sawq* [56] was in 1954 as follows. Field no. 1 (fig. 1) pays a contribution of 10*s*. per 100 *maṭīrah*-plots, no. 2 pays 10*s*. per 200, no. 3 10*s*. per 300, and so on up to the seventh field in a series in some areas, where the proprietor pays 10*s*. on 700 *maṭīrah*-plots. I suppose the justice in this arrangement is that the proprietor of the first field can be certain that if there is any flood-water his field will get what is available, but the chances of the other fields being flooded diminish in proportion, and from my casual observations in various parts of Ḥaḍramawt it is evident that the lower-lying fields in some places ' drink ' only in good rain years, for one often sees them lying uncultivated and unwatered while the crop is doing well on the upper fields. It appears that the *hijj* (pl. *hawāyij*) or *ḍamd*,[57] the acre, or area that can be ploughed by a yoke of oxen in one day, is not used here as it is elsewhere. In Ḥuraiḍah town there exist agreements on the rates of payment for each category of agricultural work and repairs,[58] no doubt written documents which should be interesting, but time did not permit of my collecting samples and having them explained—not an easy matter. At Hainin in the main Wādī Ḥaḍramawt, and at one time a sort of capital, I was told in 1948 that there was what they called a *kẖaiyil*, a Nahdī tribesman, an old man whose function it was to divide out the work on dams, state what the wages of workers as individuals in relation to the work should be, and in general deal with costing all agricultural work.

When I last visited Ḥuraiḍah in August 1954 I was surprised to see both *sẖarā'if* and *sādah* working alongside the peasants in the fields. In other parts of the country one would not be likely to see this; especially unusual would it be to see *sẖarīfahs* working in the open, but I did have friends among the younger *saiyids* in Tarīm in 1947 who told me that as a voluntary effort they had taken to working on well irrigation (*sināwah*) during the famine in the latter half of the war, and they had found it excellent exercise, but this is quite outside what has long been regarded as the norm in that part of Ḥaḍramawt, that the *saiyid* does not engage in agriculture. I should not like to say whether the agricultural activities of the *sādah* in Ḥuraiḍah have continued from the stage in the development of Ḥaḍramī society when *saiyids* and *maseẖāyikẖ* did engage in manual work, as I think I have seen hinted or noted in the volumes of *Manāqib* of the saints, or whether the recent hard conditions in the *Qiblī*

[55] cf. the section on corvée, *infra*, p. 59–60.

[56] The word also occurs in the *Mulakẖkẖaṣ al-fitan*, fol. 12v., *sawq al-mā' ilā ummahātihi min maqāni' al-ra'īyah fi 'l-sẖu'ūb wa-'l-wādī*.

[57] I heard a Yemenite use *ḍumaid* as a pl. to this word.

[58] Where food forms a part of the payment it is known in Ḥuraiḍah as *ḍuẖā*, explained as the *gẖadā* of other districts.

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or western part of Ḥaḍramawt, commencing perhaps with the war-time famine, have broken down this convention.

In this connexion it is worth recording that the *jihāz* which I have rendered as ' bride-price ' [59] in Ḥuraiḍah was at the time of my visit, as follows :

Saiyids (who call it *ṣadāq*)	50*s*. for a virgin
Mashāyikh	80*s*. to 100*s*. for a virgin
Peasants	300*s*. for a virgin
	150*s*. for a non-virgin

I have not recorded payments for non-virgins in the other cases, but it is probably half also. In all classes the *mahr* is 9*s*. It was stated that the *ṣadāq* of the *sādah* was formerly 5 ocques of silver. It will be seen that marriage in Ḥuraiḍah is not expensive, but as elsewhere in Ḥaḍramawt of the interior because of the massive emigration, women far outnumber men. As I have earlier remarked [60] the bride-price is indicative to some extent of the economic value of a married woman's services.

A pleasant ceremony, which I witnessed from the Āl al-'Aṭṭās house, is called *al-Būb*. At the season of the date-harvest village people come round the houses of Ḥuraiḍah, accompanied by a couple of drums and a conch-shell upon which, from time to time, they blow a note, dancing and playing to the tune under the houses. Women and even unmarried girls are to be found in the party, dancing and clapping their hands. When they stop before a house they sing to those watching them from the first and upper floors,

دار مَن يَا مَحْيَاها الله يِسلِّم مَوْلاها

' Whose house is this ? May it prosper,[61]
May the good God save its master '.

They ask the house for dates, and each house will scatter to them a *khubrah* or two, i.e. a basket-cover [62] full of dates. By way of thanking the people of the house when the latter sprinkle the dates down on them (*yarushshūn al-tamr 'alai-hum*) they sing,

يـا الله على عَيْبُون من كلّ بارق سَيْل
وسيـل بـالبُكْـرَه وسيل تالِى الليـل

' Be there, O God, upon 'Aibūn,
From each lightning, a flood that flows,
At early morning time, a flood,
At night a new flood that follows '.

[59] Ibn Ḥajar, *al-Fatāwā al-kubrā*, Cairo, 1938, IV, 111, alludes to *jihāz* as the present of the bride before marriage. See ' Recent marriage legislation from al-Mukallā ', *BSOAS*, XXV, 3, 1962, 482 *passim*.

[60] ' Two tribal law cases, 2 ', *JRAS*, 1951, Pts. 3–4, 156. The Ḥuraiḍah prices for 1954 are much lower than those for Tarīm in 1947.

[61] More strictly literally the sense appears to be ' how flourishing it is with *karam* (generosity) '.

[62] The *khubrah* is placed over the ripening dates to keep off birds.

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Irrigation at Tarīm

Although the irrigated palm gardens or plantations in fig. 8 were sketched for me at Tarīm, and the nomenclature of the fields and structures is consequently that of this district, and might not be current elsewhere, the actual method of dealing with flood irrigation is probably practised over many parts of Ḥaḍramawt.

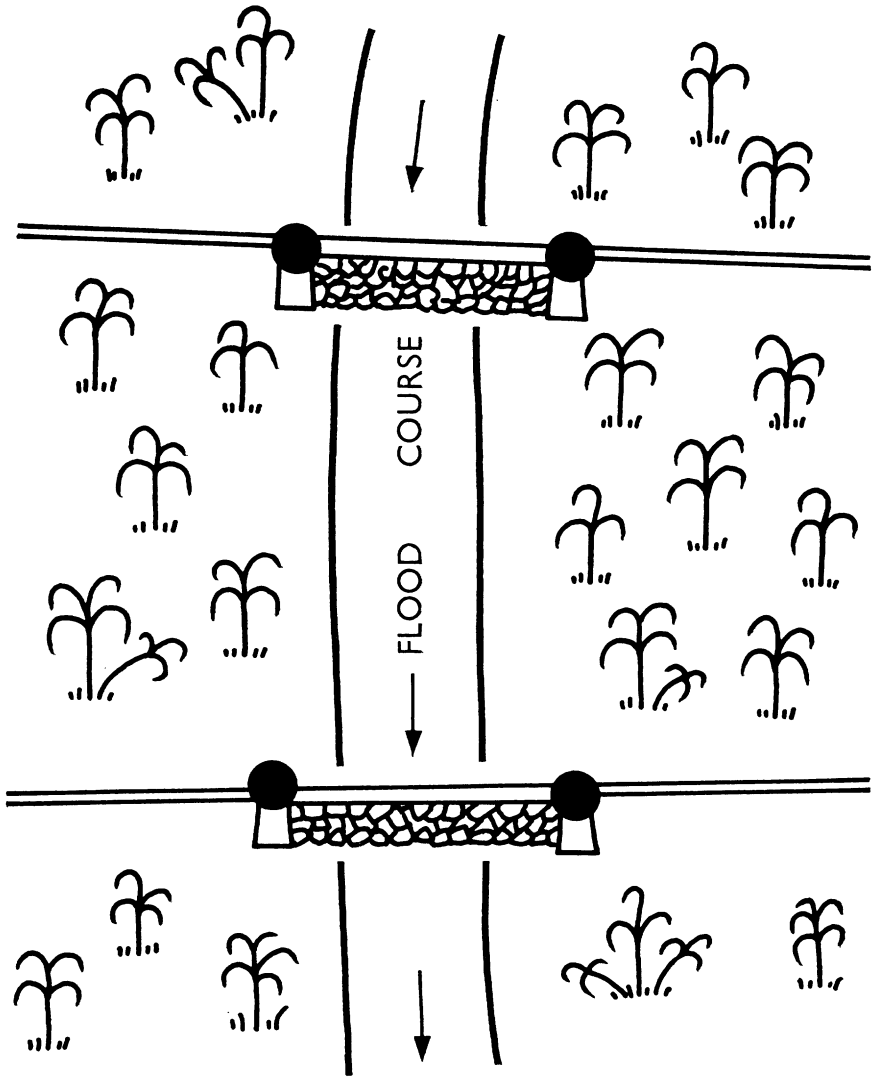

FIG. 8. The *misyāl* or flood-course is crossed by barrages (*maḍla'ah*) at intervals, each ending in a stone cairn but continued with a bank on each side of the river. Below each barrage is a stone sill flanked by buttresses supporting the cairns. The barrage and its arms (*'ādah*) raise the level of the water to irrigate the palm trees in the gardens on each side of the flood-course, and the surplus spills over the barrage to water areas below.

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The flood-course down which the torrent pours after rains in the mountains is called *misyāl* or *qaṣabah*. At appropriate places a *maḍla'ah* or barrage is constructed across the flood-course, so that in effect one might find a series of barrages descending the *wādī*. Each barrage will deflect a portion of the flood-water to irrigate its own sector while the surplus spills over the barrage to irrigate sectors below it. There is some reason to believe, though this awaits detailed survey, that the Wādī Ḥaḍramawt and its tributary *wādīs* down to Qabr Hūd where it narrows markedly, had, in ancient times, a more or less complete succession of barrages. The force of the floods was thereby broken, or perhaps the barrages never allowed the floods to gather great force to destroy and cause deep erosion, while utilizing the waters to the full for irrigation purposes, so that, as legend has it, one could walk most of the way under the shade of palm trees from Ḥuraiḍah to Hūd.

Since those days, however, floods have scored deep ruts in the *misyāl*, and at 'Īnāt, for instance, have eaten back into the *misyāl* up-stream. At the famous *Nuqrah* [63] below 'Īnāt the flood-waters have carved a small canyon, perhaps 50–60 feet deep, in the alluvial clay bottom of the Wādī Ḥaḍramawt. In the lower Wādī Ḥaḍramawt especially there are large areas where Shanbal in the early tenth/sixteenth century, and even later historians, knew prosperous villages and little towns where now there is hard dry plain, but there has been erosion in the upper Wādī as well. At Ḥaid Qāsim, just above Tarīm, one can see dying palms, but Tarīmīs tell me they can remember flourishing plantations there in their own lifetimes.

To return, however, to fig. 8, the *maḍla'ah* or barrage consists of a stone wall constructed in courses (*ḥabl* [64]) running from one side of the *misyāl* to the other, the top course being known as the *mardam* [65] or sill. At each end of the barrage is a *bikrah* (pl. *bikār*),[66] a stone mound or cairn; these *bikār* have buttresses on the lower side known as *zāḥimah* (pl. *zawāḥim*), a term also applied to a buttress to a house.[67] The barrage will generally be sloping or inclined (*maḍla'ah mukharraṭah* [68]), and in front of it lies a stone apron (*salqah*, pl. *salaq*; the word *salqah* in other districts known to me as meaning a palm-leaf mat). The flood-water pours on to the apron but does not, in consequence,

[63] cf. *Gloss. daṭ.*, *nuqrah* and *naqar*. Cf. D. v. d. Meulen and H. v. Wissmann, *Ḥaḍramaut*, Leiden, 1932, 148–9. Raḥaiyam describes a *nuqrah* as *majrā al-mā'—al-masīlah, min al-ṭīn al-mutawassiṭ al-rakhwah*. W. Popper, *Extracts from Abū 'l-Maḥāsin ibn Tughrī Birdi's chronicle* (*Ḥawādiṯh al-duhūr*), Berkeley, 1930–42, glossary, cites *makān n q r*, a tract of land, once a *birkah*.

[64] cf. *supra*, p. 43, n. 35. *Al-Shāmil*, 186, defines a *maḍla'ah* as a barrier (*ḥājiz*) of stone, constructed at a field (*jarb*), or basin containing palms (*ḥawḍ al-nakhl*), or the side of a *sāqiyah* to revet (*ḥajaza*) it against collapse and retain its water and soil.

[65] '*Al-Lughat al-dārijah bi-Ḥaḍramawt*', *al-Rābiṭat al-'Alawīyah* (Batavia), I, 3, A.H. 1347, 169–71, citing *mirdam* as used in the area.

[66] *Gloss. daṭ.*, 192, *bikār* 'colonne'.

[67] To buttress is *zaḥḥam*. Raḥaiyam said, *Al-zāḥimah tarfud-uh* 'the buttress supports it'. *Rifād* means 'support'.

[68] I have also noted a form *mukhraṭah*.

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form a pool below the barrage, though I have seen just such a pool below a barrage in the *masīlah* below Tarīm. Beyond the cairns on each side lies a clay bank, usually distinguished here as *baḥrī* (southern) and *najdī* (northern), the clay banks themselves being known as *'ādah* (pl. *'īd*).[69] These act as extensions to the barrage to hold the flood-water, and deflect it back up-stream to irrigate the *ḥuyūd* (s. *ḥaid*) or palm plantations lying on each side of the *misyāl*.

Usages of which I have noted examples include the following: *Zād 'ala 'l-'ādah ilā nuṣṣ al-bikār* 'It (the flood-water) rose to the *'ādah* to half-way up the cairns'[70]; *Ṭalli' ḥabl fi 'l-'īd al-yumnā* 'Add a course to (heighten) the right-hand clay banks'. One speaks of a *sail 'affāsh*[71] *farash fi 'l-ḥaid*, rendered as a flood which *istamadd aw 'amm al-nakhl bi-'l-saqy* 'covered all the palms with water'. *'Ammat al-maḍla'ah* means that a flood covers the barrage and the palm plantations.

In the side of the Masīlah below Tarīm, I noticed, a good few years ago now, a short passage either cut or tunnelled through the hard clay bank at an angle

FIG. 9. Dam or barrage at Tin'ah, with extensions (*illīd/al-yad*) terminating in cairns (*'arūs*).

to the flood-bed, leading the water off the Masīlah to palms. It was called an *'ambarah*. At this distance in time I cannot recollect whether it was for the purpose of filling a pit from which the water would be used to irrigate the palms until it was exhausted, as indeed I think, or whether some other use was made of it. However, the *ḥasī*, a shallow well dug to catch the *sail*-flow which is then used for irrigation, is well known, so that there is even a saying, *Man baghā 'l-mā' yaḥsī luh* 'He who wishes water must make a well to catch it'.

The irrigation system in fig. 10 was described to me as *jarb fawq jarb*[72]

[69] At the village of Tin'ah our Tamīmī camel-man called the part corresponding to the *'ādah* by the name *illīd* (i.e. *al-yad*), and the cairn, *'arūs* (fig. 9). According to *al-Rābiṭat al-'Alawīyah* (Batavia), I, 3, A.H. 1347, 169, it is a wall or column (*ḥā'iṭ aw usṭuwānah*) in a house. In Saiwūn *al-yad* is called *al-ḥāmil*.

[70] My rendering made without further reference to the informant is slightly dubious here, for it might mean that the flood-water was higher than usual, half-way up the cairns.

[71] *'Affāsh* does not figure in the lexicons consulted.

[72] For various forms of this word cf. *Gloss. dat.*, 275 seq. The hagiology known as *al-Jawhar al-shaffāf*, story 379, speaks of *sāqiyat jarb Abī 'l-Ḥasan* 'the channel of the field of Abī al-Ḥasan'. *Al-Shāmil*, 210, speaks of *jurūb fi ḥijl Ṣif*, i.e. 'fields in the cultivated land of Ṣif', the latter a village of Wādī Daw'an, known as *Jurūb al-Darasah*, or 'the Students' Fields', because they were a *waqf* to maintain students. A part of these being destroyed by flood, it was put out on a *munāsharah* or *mufākhadhah* contract (cf. p. 62, n. 110) by which the cultivator (*fakhīdh*) who restored and replanted it obtained half the fields and half remained with the *waqf*. I do not know whether there is any difference between *jurūb* and *dhabr*. Landberg describes *dhabr* as 'terrain arrosé par la noria ou la pluie, champ'. He states that it is often pronounced *dabr*. I have seen it written in MSS as *ḍabr*, with *ḍād*. This brings it near to the root *ẓbr*, rendered by A. Jamme, 'South Arabian', in J. B. Pritchard, *Ancient Near Eastern texts*, Princeton, 1955, with a query, as 'land-measure or weight'. Bā Hārūn, op. cit., fol. 45r., has an example of its usage, *Jā Wādī Dammūn bi-sail 'aẓīm wa-sharibat jamī' dhubūr al-bilād.*

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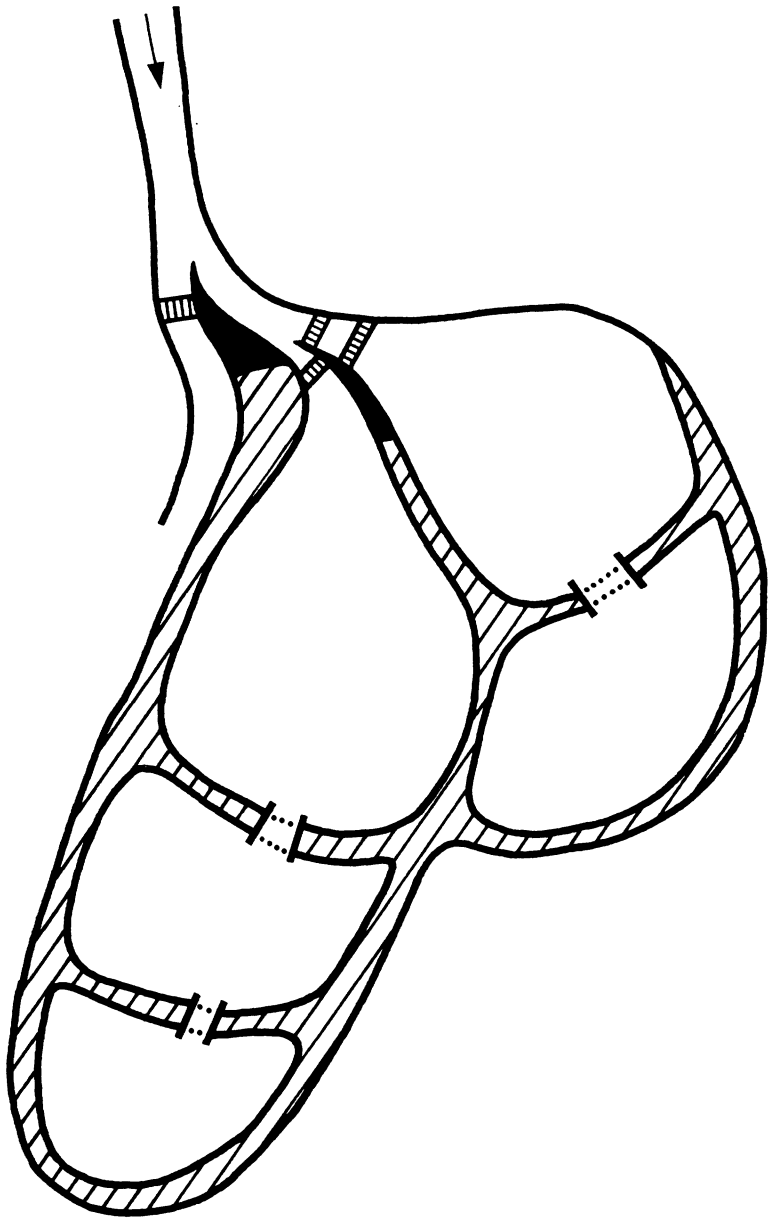

FIG. 10. Field above field (*jarb fawq jarb*). The *sāqiyah*-channel divides at a masonry tongue called a *ḍark*. One of the channels subdivides again to irrigate two series of fields. Across the entrances to these are low stone *marṣads* to prevent erosion, but they do not impede the flow of water. The higher set of fields ' drink ' first. Cuttings are made in the banks to allow the lower fields to be irrigated in sequence.

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' field above field ', and this is probably the commonest type of irrigation system in the Aden Protectorate.

The main water-channel is divided, and at the right-hand smaller channel as it branches off from the other, is a *marṣad*, this being described to me as a low barrage (*maḍla'ah*), about 6 inches in height, really in fact a stone line across the bed of a channel or *wādī*. *Marṣad* was stated to be a term applied to anything smaller than a *maḍla'ah*.[73] At each side of the *marṣad* would be a stone cairn (*bakrah*). Further down, the left-hand channel is once more subdivided into two small channels leading to the fields and separated by a masonry tongue called a *ḍark* (pl. *ḍurūk*). The fields (*jurūb*) ' drink ' in succession, the lower from the higher, but of course where the channel is divided the higher ground would ' drink ' before the lower ground.

In Tarīm an *'uqdah* (pl. *'uqad*) seems to be a sunken piece of land lower than *jurūb* ; it is said to be synonymous with *fijrah* (pl. *fijār*).[74] You could find *'uqdah ba'd 'uqdah*, one piece of sunken ground lower than another, and one speaks also of *shurūy wa-'uqad*.[75] Another common word for an irrigation channel is *'atim* [76] ; I have noted a phrase, *makhdūm al-'atim 'alaih*, described as *maṭrūq bi-nūrah* ' covered with lime-plaster '.

The Āl Bā Ḥuraish [77] are master masons (*ma'ālimah ṣanā'ah al-aḥjār*) at Tarīm who construct barrages (*sudūd*) but there are many *fakhāyidh* of masons there, the Bā Sumbul, the Āl Bā 'Adail, and the Āl Bā 'Awḍān. At Dammūn next to Tarīm the Āl Nīnū carry out the same type of work. From another *wādī* in the district, the Āl 'Abūdān have experience in the management (?) [78] of water (*'inda-hum khibrah bi-ta'dīl al-mā'*), they are estimators for water-channels (*mukhamminīn li-'l-masāqī*), for the management of water-channels

[73] Ibn Ḥajar, op. cit., III, 64, discussing the *manāfidh* ' exits ' of a *sāqiyah*-channel, says, بعض منافذها مرصد بوضع أحجار فيها ولا يسد من المنافذ لشرب آخر. In Tarīm *marṣad* (pl. *marāṣid*) was said to mean *maqāsim al-mā'*, a place where the stream is divided (cf. p. 40, n. 28), but I was also told that a *marṣad* is a low *maḍla'ah*, about 6 inches high, really a stone line across a *wādī* or a channel-bed. Cf. *raṣa'ah, marṣū'*, etc. Lane and Dozy are not very helpful on either root.

[74] Raḥaiyam defined a *fijrah* as *al-arḍ al-ghawīṭah al-ñāzilah min al-mustawiyah al-mutaḍāyiqah.*

[75] *Shurūy, shurūj*; cf. *Gloss. dat.*, 2034; 'Star-calendars', 450. Vatican MS no. 1362 in *Bāb al-suyūl wa-'l-miyāh*, though disappointing in that the usages all seem to be purely classical, records that *al-shirāj* are *madāfi' al-mā' min al-ḥizzān ila 'l-suhūl*. The Yemenite *Tarjī' al-aṭyār*, 308, states, الشرج جمع شريج وهو القطعة من الأرض وهو فى الأصل مدخل الماء من السائلة الكبرى. My own notes from Tarīm describe a *sharj* as a part of the *wādī* in which there is arable soil (*ṭīn*) and *'ilb* trees, and where one has fields. It is near the *misyāl* or else it may be watered direct from the spill from the mountains. A *sharj* can be irrigated by a *sail* or by rain, but not by *sināwah*.

[76] An Aden newspaper defined the *'atim* as *majārī fī 'l-arḍ makshūfah li-tantafi' bi-'l-mā' al-ashjār wa-'l-mazrū'āt al-mujāwirah li-'l-majārī.*

[77] They are also the grave-diggers ; cf. ' The cemeteries of Tarīm ', *Le Muséon*, LXII, 1–2, 1949, 159.

[78] *Ta'dīl* might mean ' levelling, adjusting '. Perhaps the Āl Bā 'Adail are so named because of their specializing in this craft. The Bā Sumbul are stone-workers.

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(*li-ta'dīl masāqī al-mā'*), i.e. water dividers and series of steps (*marāṣid wa-marāqī* [79]). Raḥaiyam added that, in ancient times, the Āl 'Abūdān used to construct the channels which take the water from higher up and go deep into the earth and appear in another area at the top of the earth (*al-budūd alladhī ya'khudh al-mā' min a'lā wa-yaghūr* (*yaghīṣ*) [80] *fi 'l-arḍ wa-yaẓhur min jānib thānī fī a'lā 'l-arḍ*). I do not think that he was alluding to *qanāts* but rather perhaps to some underground or covered channels such as one may see in the ruined town of al-Ḥāfah in Dathīnah.

Raḥaiyam also quoted to me the popular saw, *Kull arḍ razzim-hā bi-ḥajar-hā*, which might be rendered, ' Build up strongly each piece of land with its own stones '.[81] He stated that *razzam* meant *makkan-hā wa-sawwas-hā* but he also said that it meant to fill up a hole without much arrangement.

Legal questions arising from flood irrigation

Naturally disputes over the use of flood-waters give rise to many questions in law, be it customary law, or be it *sharī'ah*, and the three cases which follow are merely those which have come to my notice and appear to be illustrative of differences which may come about between the various parties.

The *Fatāwā* of Bā Makhramah [82] include one case where land is rented for agricultural purposes. The agreement was concluded before the land had ' drunk ', and was for the period of a year. The land in question usually ' drinks rain-water either in *Ṣaif* (April–June) or in *Kharīf* (July–September) ' (*tashrab min mā' al-maṭar immā ṣaif-an aw kharīf-an*). If there is no rainfall (*ḥuṣūl al-maṭar*) during this period, asks the questioner, does the contract still hold good ? Bā Makhramah, reasonably enough, holds that it does and that it cannot be rescinded.

Another problem in the same collection [83] is stated in the following terms :

مسألة رجل استاجر أرضاً ثم حرثها وعمرها ثم جاء السيل وأجبر عبرها فلم يمكنه سقيها إلّا بعمارة العبر وامتنع اهل الأرض من العمارة فهل له الفسخ واذا فسخ هل له الرجوع على الموجر بما اصرفه فى حرث الأرض ام لا؟

' The question of a man who rents ground which he then ploughs and cultivates. The flood then comes and cuts (?) [84] the bank of it, so that it is impossible to

[79] A *marqā* means a *darajah* or step, as in Lane.

[80] *Ghāṣ, yaghīṣ, Ḥaḍramoût*, 672.

[81] In the Yemen *razm* can mean a water-channel, and *Gloss. daṭ.* discusses this root at some length. The *Tarjī' al-aṭyār* says that a *marzam* is ' what is placed upon something to make it firm and prevent it from moving and shifting from its place '. The proverb resembles another I heard in Tarīm, *Dāwī 'l-ḥimār min rawth-ah* ' Cure/treat the ass by its dung '. The dung is to be mashed up and placed on the animal's sore.

[82] Photocopy in SOAS Library, fol. 291r.

[83] ibid., fol. 792v.

[84] *Ajbara* is probably to be so rendered ; cf. Dozy, *Supplément*, *jabr al-bahr* ' cutting of a canal bank ', an Egyptian usage. '*Ubar* could be the bank leading to the field, which it probably is in this case.

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irrigate it without reconstructing the bank, but the owners of the land refuse to repair (it). Can he renounce the contract, and if he renounces (it) may he come back to the party who has let it out (to him) for what he has expended on ploughing the land or not ? '

Bā Makhramah decides that he may renounce the contract and claim from the party that let to him what he has lost.

The third case is taken from a MS work in my possession, of Bā Ṣabrain,[85] and may apply more particularly to the Wādī Daw'an or the western districts of Ḥaḍramawt.

إذا أخذ السيل حرثَ أو حجرَ جماعةٍ معلومين، أو جماعة فى حجال معلومة، فهو مال مشترك بينهم بنسبة أموالهم، لا مُباحًا ولا ضائعًا، فلا يُملك بإحرازه فضلاً عن مجرّد وضع علامة عليه. فمن أعظم المنكرات التحجّر على شىء من ذلك لغير شريك فيه، أو على زائد على ما يخصه منه. أمّا ما يجيبه السيل من حجر وطين أو رَبْش فمباحة، [*sic*]، فلمن أحرزه وحازه ملكاً، ولمن علّم عليه علامةً أُولَويّةُ استحقاق. فلو علّمه رجل وربّخه الثانى ملك المربِّخ، لا المعلّم عليه علامة. أو مملوكة لمجهول فهو مال ضائع، لا مباحًا ولا مشتركاً. أو لمعلوم فهو باقى على ملكه ومثل ذالك الخشب والمقَالِع.

' If the flood-water takes plough-land or stones of persons known, or of a group (with ownership in certain) known fields,[86] then this is property held in common among them in proportion to their properties (i.e. land), neither in a state of being open to acquisition, nor lost. Nor does it become possessed by being acquired, far less by merely placing a mark upon it. A major reprehensible action is the appropriation of any of it by someone who has no share in it, or the appropriation of more of it than that to which one is entitled.

Concerning what the flood brings in the way of stones and earth or mixed dung and earth,[87] this is open to acquisition. It then belongs to the person who acquires and obtains it as a possession ; the person who first marks it with a mark has priority of entitlement. Should one man mark it and a second loosen [88] it (the earth), the person who loosens (it) and not the marker of it with a mark has possession of it.

[85] 'Alī b. Muḥ. b. Sa'īd Abū Ṣabrain, *al-Muhimmāt al-dīnīyah fī ba'ḍ al-murtakab min al-manāhī al-rabbānīyah*, p. 24, no. 66. The author flourished in 1294/1877. Cf. ' Materials for South Arabian history, II ', *BSOAS*, XIII, 3, 1950, 593.

[86] *Ḥijl* (pl. *ḥijāl*) is cultivated land of any area. 'Alawī b. Ṭāhir, *K. al-Shāmil* (SOAS photocopy) calls it *al-ḥaql wa-'l-jurūb*.

[87] *Rabsh* is the dung brought down by the flood mixed with all kinds of debris. Cf. *marbashah*, the palm-leaf basket used by cultivators, presumably used for carrying *rabsh* as well as for other purposes.

[88] *Rabbakh* ' to loosen ', probably here, ' to remove '. The text is not easy to interpret at this point, and seems almost to contradict itself.

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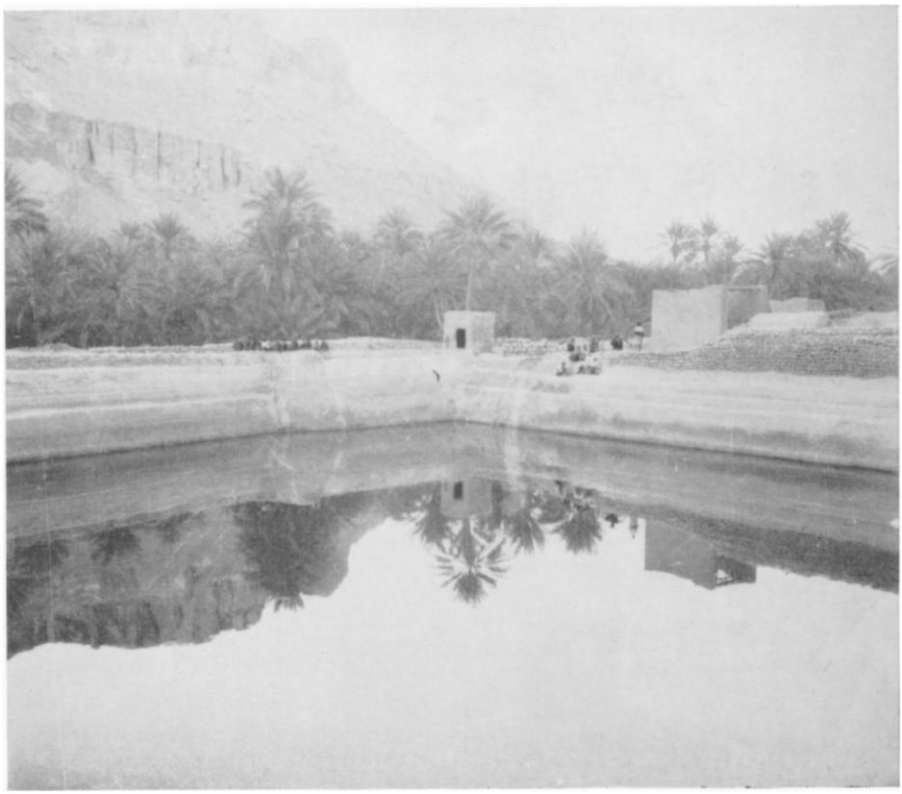

A large *karīf* at Qaidūn of Wādī Daw'an, of stepped and plastered construction, for holding water probably for use in irrigation.

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Plate II

[*Courtesy Royal Air Force*

Flood irrigation at Shibām. Shibām from the north-west. Jabal al-Khibbah (also known as Jabal Shibām) is the name of the massif projecting from the Jōl plateau, and bounded on the east by Wādī Bin ʿAlī. The Masīlah runs across in front of J. al-Khibbah from west to east. Under J. al-Khibbah lies the suburb al-Saḥīl with cultivation and palm-gardens. On the north side of the Masīlah lies Shibām, surrounded on all sides except where it borders the Masīlah by palm-gardens. The large circular patch of lighter ground to the west of Shibām is the cemetery, Jarb Haiṣam ; it may stand a little higher than the fields which surround it. From the right of the illustration the *sāqiyah*-channels can be perceived, radiating out into the cultivated area, although the upper part of these *sāqiyahs*, lying further west, does not appear. The medieval *Manāqib Bā ʿAbbād* refers to the *sāqiyat al-balad Shibām.*

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[*Courtesy Royal Air Force*

Flood irrigation at Shibām. Direct aerial view of Shibām. Jabal al-Khibbah occupies the upper part of the illustration with al-Saḥīl beneath it, its gardens receiving their irrigation from the overspill of the mountain, and at other times by well-watering. The tower known as Ḥuṣn al-Khibbah which protects Shibām from rifle-fire from the top of J. al-Khibbah can be seen as a dot in a white circle at the top of the ridge along the top of the picture. It is reached by a path running up from the right-hand tip of the mountain, i.e. west of Shibām town. On the Jōl at al-Khibbah there are many small firing sangars (*mirbāh*, pl. *marābī*) all over the mountain top, as also some areas for grazing and some small *sudds* to collect water. The Masīlah runs from west to east across the illustration, its broad western end being planted with palms in the actual bed of the *wādī*, but doubtless in an area where it is not anticipated that a *sail* would come with sufficient force to uproot them. Shibām town lies along the Masīlah. It is walled, and upon a fairly high mound which the *sail* would be unable to destroy—for this reason Shibām is sometimes called al-Dimnah. Drinking water, rather brackish to taste, is obtained from wells in the actual Masīlah in front of the town. This illustration shows very well the high banks round the fields which I believe to be the result of hundreds of years of piling up the surplus silt brought down by the *sail* on to the fields, on to the field-banks.

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[*Courtesy Royal Air Force*

Wādī irrigation in Ḥaḍramawt. In the bottom left-hand corner two *wādīs* join to form a single *masīlah* or flood-bed. At flood-time the deflectors and *sāqiyah*-channels catch the *sail* and lead it to the fields on both sides of the *wādī*. The villages stand on higher ground or on eminences in the *wādī* to which the flood will not mount, but there has been planting of palms even perhaps in the *masīlah* itself though in parts where the current is not likely to be strong; perhaps these can be described as *nukḫr*. The mountains terminate in stony scree which meets the alluvial soil of the *wādī*, and it is this that I understand to be the *safḥ al-jabal* to which the water rose and covered the lower section in the flood of 894/1488–9.

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Or else it is possessed by a person unknown—then it is lost property, neither open to acquisition, nor held in common. Or else it belongs to a person known—in which case he continues in possession of it.

Wood and palm trees [89] are the same.'

Qanāts

The *qanāt* system is generally associated with Persia, though it is thought that under Arab influence *qanāts* were introduced into North Africa and even into such a place as Madrid.[90] They appear to be recorded as in existence in pre-Islamic Arabic from the evidence which will be cited, but this does not preclude their having been introduced there by the Persians who are believed by ancient authors to have constructed cisterns at Aden, Jeddah, and possibly other places. In default of established data, however, it would be idle at present to argue where and by whom the *qanāt* system was invented. The anonymous author of *al-Ḥayāt al-sa'īdah* [91] discusses them in the following passage.

'*Al-qinīy* is the plural of *qanā*, and *qanā* is the plural of *qanāt*, while *kiẓāmah* has a plural *kaẓā'im*.[92] Their essential meaning is that they are the wells/pits dug into the earth one after the other, in order that their water may be brought forth and flow upon the face of the earth. In the Tradition [93] there are tithes (*'ushūr*) upon what the heavens and the *qanāts* irrigate. In the *Lisān al-'Arab* [94] he says, " The *kiẓāmah* is a *qanāt* in the inside (*bāṭin*) of the ground in which water runs ". In the Tradition (it says) that the Prophet came to the *kiẓāmah* of a tribe and performed the ritual ablution from it and rubbed over his boots. The *kiẓāmah* is like the *qanāt*, its plural being *kaẓā'im*. Abū 'Ubaidah said, " I asked al-Aṣma'ī about it, and expert people of the Hejaz, and they said, ' They are wells in a series, excavated and set at a distance from each other, then what lies between each two wells is pierced by a *qanāt* conducting the water from the first to that which lies next to it under the (surface of the) earth so that their waters come flowing together, then emerge at the end of them flowing on the surface of the earth ' ". According to the Tradition of 'Abdullāh b. 'Amr, " When you see that Mecca has been dug (full of) *kiẓāmahs* and its buildings are level with the tops of the mountains then know that the end has drawn near you " '.

To the east of Ghail Bā Wazīr is a rocky plateau in which there are large

[89] *Maqla'* (pl. *maqāli'*), a palm tree.

[90] Jaime Oliver Asin, *Historia del nombre Madrid*, Madrid, 1959. Cf. Norman N. Lewis, ' Malaria, irrigation, and soil erosion in central Syria ', *Geographical Review*, XXXIX, 2, 1949, 287, for *qanāts* and '*foggaras* ' in Syria.

[91] op. cit., 26 seq.

[92] Rossi, ' Note sull' irrigazione . . .', 356, describes a ' *kadāmah* ' apparently similar to our *kiẓāmah*. Cf. G. van Vloten, *Liber Mafâtîh al-olûm* (al-Khwārizmī), Leiden, 1895, 71, *al-kaẓā'im al-miyāh al-jāriyah taḥt al-arḍ miṯl al-qunīy ' kaẓā'im* are waters running under the ground like *qanāts* '.

[93] I have not discovered the Tradition in this form in A. J. Wensinck, *Concordance . . . de la Tradition musulmane*, Leiden, 1933– .

[94] Beirut edition, 1956, XII, 521.

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quarry-like holes perhaps 30 feet from ground level to the surface of the water with which they are filled. These are of natural origin and their water is warm and has a sulphurous smell; they appear to be deep. These holes, in one of which we used to bathe, are known as *ḥawmah* (pl. *ḥuwam*), and from them an underground *sāqiyah*, punctuated at intervals by vertical shafts leading to the surface, around which the excavated debris lies, conducts the water from the *ḥawmah* to the lower ground to the south which it irrigates. I recall that in some places there seem to be small plots irrigated by bucket from wells or these shafts, and tobacco is grown there.

To Mr. A. M. Bā Ḥashwān I am indebted for additional information on the *qanāts*. These he says are spoken of locally as *mi'yān*, which is the name of the channel itself, the vertical shafts being called *naqab*. At Ghail Bā Wazīr the family which constructs these irrigation works is called Bar'īyah, and there would be a *muqaddam* or foreman to each three or four workers. There is a well-known *ḥawmah* called Ḥawmat al-'Arūs in which people avoid bathing since, it is said, a bride was being conducted on a camel to her husband when during the brief absence of her escort, the camel slipped into the *ḥawmah* and was drowned. At al-Qārah the largest *mi'yān* is called al-Ḥarth, but the water of it being brackish, is not drunk.

There may be *qanāts* of this type further to the east of al-Mukallā and al-Shiḥr, but I know of nothing to the west although I have travelled along most of the coast, apart from some curious underground channels ending in a sort of pond at Ruḍūm in the Wāḥidī sultanate.[95] *Al-Ḥayāt al-sa'īdah* [96] even alludes to a wooden *mīzān* (lit. ' balance ', perhaps a level ?) which he describes as *dhu 'l-shāqūl* and *ālah dhāt al-shāqūl*, i.e. with a plumb-line, which is used to ascertain the level of the bottom of the well and the slope of the hill to the cultivated ground below. He states that he saw Saiyid Muḥ. b. Ṭāhir al-Ḥaddād use this instrument when constructing a *sāqiyah* at Qaidūn and another at Jidfarat al-Zinjī.

Water supplies on the Jōl

Very few people live on the Jōl, but there are occasional small villages of some stone-built houses. Visiting al-Najadain in 1948, I saw a cistern (*naqabah*, pl. *niqāb*) being hollowed out in a slight depression near the fort. An iron bar was drilled into the stone by hand to break it up, the operation involving no small labour.[97] The rain-water runs off into the *naqabah* which is usually

[95] Other writers allude to *qanāts* which I have not seen, and there may be more perhaps also at Aḥwar which I have not yet visited. For Oman one may probably find information on *qanāts* or relevant thereto, in 'Abdullāh al-Sālimī, *Jawhar al-niẓām*, Cairo, A.H. 1345, especially II, 56 seq., *Bāb al-sawāqī*.

[96] op. cit., 27–9. According to the *Tāj al-'arūs*, the *shāqūl* is an iron-shod pole in use among the cultivators at Basra, about 2 cubits (*dhirā'*) high, but from the rather summary description I cannot discern how it is used. Dozy, *Supplément*, describes *shāqūl* as ' plomb ou fil à plomb '. Cf. *Liber Mafâtîh al-olûm*, 255, which describes it as a plumb-line used by carpenters and builders.

[97] 'Alawī b. Ṭāhir, *K. al-Shāmil*, 89, says of a *naqabah* that the ground is excavated to the depth of a fathom (*tunqab al-arḍ qadr qāmah*).

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wide at the bottom, clearly to minimize the loss by evaporation. The *naqabah* I saw was not more than six feet deep, and two men could stand in it to work the iron bar.

A larger type of receptacle for water conservation is to be found in the *karīf* which is a sort of pond, generally formed by damming a convenient hollow and leading the rain-water to drain into it from the surrounding ground, by little runnels consisting of lines of stones leading to the *karīf*. There are many of these all over the Jōl. The people drink from the *naqabah* and keep the *karīf* water for animals. There are of course flood-courses on the Jōl and for a short time after rain they run merrily, but they are very soon empty once more. A larger and more complicated *karīf* is sometimes used in the Wādī Daw'an and elsewhere, such as the stepped *karīf* at Qaidūn (pl. I) with cemented sides. The *karīf* of Ḥabbān known as Sāqiyah Badr Bū Ṭuwairiq is famous; it lies beside the *wādī*-bed and the *sail* is led into it by a short tunnel.

The late Sulṭān Ṣāliḥ b. Ghālib al-Qu'aiṭī,[98] writing of the Jōl territory in the Daw'an province, states that pious Daw'anīs build small huts (*sirīn*) and storage cisterns for rain-water on the roads. These cisterns are either roofed (*musaqqafah*) and called *niqāb*, or without roofs and called *kuruf*. It is a trait of the Daw'anīs to devote *ṣadaqāt* to this purpose to help travellers, and many of the *Bādiyah* of Daw'an write in their bequests (*waṣāyā*) that a *sirīn* and *niqāb* should be built in their name, and this is why there are so many in Daw'an province.

Corvée

In connexion with the maintenance of irrigation works it is relevant to describe how corvée operates in Ḥaḍramawt. Corvée, unless the republican government has abolished it, which is hardly likely, was an institution in the Yemen up to the present day, known under the term *sukhrī*.[99] In Ḥaḍramawt the word *wakad* is apparently used to cover compulsory labour, but it has other senses. Should a sulṭān, for example, wish to build a house or a tower-fort (*kūt*) he compels labourers to come and work on it at a much lower rate than they are normally paid. His action is called a *nā'ibah/nāyibah*, paraphrased as *ishʿār wa-ṭalab*, i.e. notifying and request, and explained as *ilzām bi-'l-ḥuḍūr fi 'l-waqt al-muʿaiyan*, compulsion to turn up at a specified time. Raḥaiyam distinguished three categories—a *wakad dawlah*, a sulṭān's demand for compulsory labour, *wakad manṣab*, that of a *manṣab* or head of a sacred enclave, and a *wakad qabīlah*, the imposition by a tribe of compulsory labour, *scilicet* upon the labouring population under its protection. These categories of corvée would

[98] *Al-Riḥlat al-sulṭānīyah*, Cairo, A.H. 1370, 23. 'Alawī b. Ṭāhir, op. cit., calls the *karīf* a *ṣahrīj*, while Muḥ. b. Hāshim, *Riḥlah*, Cairo, A.H. 1360, 12, describes it as a *khazzān*. *Al-Shāmil*, 199 seq., has an instructive account of local disputes before the decision to build the Qaidūn *karīf*, with a poem on the event describing local wells as 100 *qāmahs* deep. Water was led into the *karīf* from a spring through pottery pipe sections (*jibh*, pl. *jubūḥ*) joined together with *nūrah* beaten up with cotton and (sesame ?) oil.

[99] E. Rossi, *L'arabo parlato a Ṣanʿá'*, Roma, 1939, 202.

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depend on which type of government was exercised over any given district, but it is interesting to see how the theocratic type of rule as exemplified in the case of the *manṣab* has also its corvée, though I expect the summons would be couched in different terms from that of the sulṭān or tribe. A case cited to me as typical would be when a *manṣab* announces a *wakad* for the repair of a large dam or deflector, and the labourers *yajurrūn madar*, lit. ' drag earth ', i.e. with oxen and a scraping board, or perhaps by other methods. Orders relating to corvée are normally given through the *Abū* or headman, and I have a document dated 1270/1853–4 detailing the procedure when a *nāyibat sulṭān* is sent to the Sūq quarter of Tarīm city. As seen already, the *wakad* is not confined to irrigation repairs, but might be for repairs to the town walls in time of danger or other purposes. This enables us to form some conception of the procedure probably followed in providing labour for the massive public works of antiquity in the ruins of which southern Arabia abounds.

The *nā'ibah* indeed is an institution which goes back to the earliest age of Islam and includes the repair of dykes/bridges (*qanāṭir*) and the stopping of breaches caused by water in a bank (*sadd al-buṯḫūq*) ; it is a term known to the western Arab world and Spain, continuing in Morocco up to modern times.[100]

Wakkad was paraphrased as *ista'jar* ' to hire, engage ',[101] and ' to make an assignment (*wa'd*) with '. *Ana muwakkad 'indak* means ' I am employed by you '. One of my corpus of documents relating to the quarters of Tarīm alludes to persons as *muwakkad fī walīmah*, i.e. employed in unpaid service at marriage festivities, at the direction, of course, of the headmen of the quarter in the way which I have already described.[102] You can, however, have *wakad al-riḍā* free employment, employment by consent. In general, there appear to be two sorts of employment, *taṣrūḥ* under which you receive ' lunch ', i.e. *tamr*, *luḵḫam*, *qahwah*, etc., dates, shark, coffee, and a *ja'ālah mu'aiyanah*, a fixed wage, the master (*mu'allim*) receiving more than an ordinary workman, and a boy less. The other type is termed *qiṭā'*, i.e. when a man estimates for a job, employs his own men to execute it, and gains or loses on the contract as he may.

Share-cropping

Share-cropping is discussed in the earliest legal works of Islam, and where South Arabia is concerned I possess ample documentation both in printed works and in MSS, as for example in the *Fatāwā* of Bā Maḵḫramah,[103] for naturally

[100] cf. M. J. de Goeje, *Liber expugnationis regionum . . . al-Beládsorí*, Leiden, 1866, glossary, 106, النائبة النازلة ونوائب المسلمين ما ينوبهم من حوائج كإصلاح القناطر وسد البثوق وغير ذلك. Dozy's *Supplément* contains further examples.

[101] *Prose and poetry*, Ar. text, p. 22, l. 18 ; *Gloss. daṯ., wakkad* ' préparer, apprêter, mettre en ordre '.

[102] ibid., pref., p. 27.

[103] See p. 35, n. 11 ; photocopy fol. 277 r.–v. Cf. Yaḥyā b. Ādam, *Kitāb al-ḵharāj*, trans. A. Ben Shemesh, *Taxation in Islam*, Leiden, 1958, 102.

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in the case-law of an agricultural community this is a subject of frequent occurrence. I should also refer to my edition of Baḥraq,[104] a treatise composed about the beginning of the sixteenth century (between A.H. 894 and 920) which contains a *musāqāh* plea. However, it is appropriate first to cite three types of contract from a much more recent author, the *shaikh* Muḥammad b. ʿAbdullāh b. Aḥmad Bā Sawdān, who composed his *Taḥṣīl al-maqṣūd fi-mā ṭuliba min taʿrīf al-ʿuqūd* [105] in 1315/1897, though his local information refers more particularly to Dawʿan than Tarīm.

(١) صيغة المساقاة

فيكتب: الحمد لله، وبعد، فقد ساق [106] (كذا) فلانٌ فلانًا على النخل المعروف بكذا، مساقاة شرعية، مدة سنة كاملة، أوّلها شهر كذا، بناصفة الثمرة؛ وعليه إصلاح النخل المذكور، وتلقيحه، وتنقية نَهرِه، وإصلاح الأجاجين، وتنحية الحشيش، وحفظ الثمر، وجَذاذه وتجفّفه؛ يفعل ذالك بنفسه، أو بنايبه.

(٢) صيغة المخابرة والمفاخذة

ويقال لها المناصبة؛ وهى دفع الأرض لمن يغرسها من عنده، والشجر بينهما بالسَوِيَّة أو التفضيل. فيكتب: الحمد لله، وبعد، فقد اتّفق فلان وفلان على أن يغرس فلان مكاناً، أو ارض الفلانى. ثم يحددها بما به حفرة [107] بما شآء من أنواع النخل، وعلى الفخيذ المَقَالِع، والمُؤَن [108]، والسقى، والتنمية الى التعتيق بعُرف الجهة؛ وذالك فَخْذ النصف، أو على المناصفة [109] تخابرا على ذالك مخابرة ومفاخذة صحيحة شرعية. كان ذالك بتاريخ يوم كذا من عام كذا.

(٣) صيغة المزارعة والمخابرة فى الارض لمن يزرعها

فيكتب: الحمد لله، وبعد، فقد قال فلانٌ لفلان زارعتُك على ارض كذا؛ وينعتها؛ لتزرعها، وعلىّ بذرها، وعليك نصف ثمرتها. ومثله: عاملتك على ارض كذا،

[104] ' Forms of plea, a Šāfiʿī manual from al-Šiḥr ', *Rivista degli Studi Orientali*, XXX, 1–2, 1955, 11.

[105] In the Āl al-Kāf Library, Tarīm. The family of Bā Sawdān lived at al-Khuraibah of Dawʿan, and are described as of Kindah. Muḥammad and his famous father ʿAbdullāh have many works in MS as yet unpublished of which I have some record. According to ʿAlawī b. Ṭāhir, *al-Shāmil*, photocopy in SOAS Library, 141, Muḥammad died in 1281/1864–5. For his biography see ʿAbdullāh b. Muḥ. al-Saqqāf, *Tārīkh al-Shuʿarā' al-Ḥaḍramīyīn* (Cairo, A.H. 1353–), III, 196–201, with a slightly different title for this *risālah*.

[106] Read *sāqā*.

[107] The *ḥufrah* is the trench or runnel, and appears to be used here much as one would say ' so many head of horse '.

[108] To be read *muʾan* (?). Bā Faqīh al-Shiḥrī's history (my MS, fol. 53r.) has the phrase مونة السفر, baggage.

[109] This phrase appears to mean that they have equal shares in the palm plantations resulting from the efforts of the planter. The term *taʿtīq* which precedes, probably means until the land and plantations are in a proper state of cultivation.

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وعليك بذرها، ولك نصف ثمرتها، مزارعة، أو مخابرة، صحيحة صريحة شرعية، جامعة الشروط المقتضية للصحّة المرعية. كان ذالك بتاريخ كذا فى عام كذا.

In the first of the aforegoing patterns of contract, the peasant engages to work on the palms for a year, in return for which he is to receive half of the date-crop. He undertakes to tend the palms, fertilize them, clean the trunks, maintain the runnels about their roots, keep them free of weed, to look after the dates, cut and dry them, either labouring himself or delegating another person to execute the work on his behalf.

The contract that follows is known as *mukhābarah* or *mufākhadhah*,[110] but Bā Sawdān adds a synonym *munāṣabah* not so far known to me from other writers or from informants; possibly it is Daw'anī. The ground is given to a man to plant with date-palms, the trees to be shared in equal parts (*bi-'l-sawīyah*) or unequally, between the two parties to the agreement. The number and types of palm to be planted are specified. *Inter alia* the working partner has to deal with the young palms (*maqla'*), irrigate them, and rear them up to the *ta'tīq*, this last term not being precisely known to me. *Mu'an*, Bā Ḥashwān informs me, means 'gear', and would include the date-basket cover (*khubrah* in Wādī Ḥaḍramawt, but perhaps more often *shāyah* (pl. *shawāy*) on the coast), the *simsim* oil used to oil the young date shoot, and the rags bound round it to shield it from the sun. He remarked that the *mawwāl* or capitalist in a share-cropping contract who owns the palms would give the *ḥarrāth* who looks after the palms, one sprig (*khīl*) of dates from each palm as his share of the contract, but this last item of information is in application to the first type of contract in this series. To this type of contract perhaps, a *rajaz* that I heard in Tarīm, sung at the ploughing (*'amālah*) and at the sowing (*ṭaiyar dharī*) alludes:

من ما مَعَهْ حرّاث يبيع المال وِالّا ينْشُرُهْ[111]

He who has no peasant-cultivators must sell his property or else give it to someone else to cultivate it (*ya'mur-uh*). The verse, I was told, alludes to that category of contract where the cultivator and owner each receive half of the crop.

The last form of contract (*supra*) appears to cover cases where the peasant

[110] The *Liber Mafâtîh al-olûm*, 16, defines *mukhābarah* as *al-muzāra'ah bi-'l-thulth aw al-rub'*, or the like. I am, however, inclined to link it with *khubrah* the basket-cover placed over the ripening dates, but the material quoted by Lane is interesting and not necessarily at variance with this suggestion. Particularly interesting is the reference to Khaibar in this connexion, where dates were an important crop. *Mufākhadhah* might be connected with *fukhṭah* the fertilization of the female palm tree, but *fākhadh* means 'to divide' as does *nāṣab* and one can say *fākhadh al-laḥm* 'he divided the meat', according to A. M. Bā Ḥashwān. Al-shaikh 'Alī b. 'Abd al-Raḥīm Bā Kathīr is known to have composed a *Manẓūmah fī Aḥkām al-muzāra'ah wa-'l-mukhābarah* (*Tar. Sh. Ḥaḍ.*, ed. cit., II, 71) but no copies are yet known. 'Abd al-Raḥmān b. Muḥ.... al-Mashhūr, *Bughyat al-mustarshidīn*, Cairo, 1936, 162 seq., has much additional informative material on *mughārasah*, *mufākhadhah*, *munāṣabah*, and *mukhāla'ah*.

[111] *Nashar* 'to give one's land to someone else to cultivate'. *Munāsharah* is similar to *mufākhadhah*, and a *nashīr* is defined as *alladhī ya'mal al-arḍ 'ind istiqbāl al-suyūl*. *Nishr* was explained to me as 'sharing in the crop'.

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is required both to cultivate field-crops and attend to palms planted on the property, as they undoubtedly would be planted along the irrigation channels leading from the wells, and probably elsewhere.

In Tarīm a *ḍa'īf* or peasant of the category called *ṣālī* (pl. *ṣilāh*) always works under a *ṭabīn* or capitalist, with a fixed wage (*murattab*), plus dates and grain, and a share in the crop (*qism fi 'l-ḥarth*). It may be observed in passing that at al-Khasha'ah where there has been considerable agricultural development of latter years, one speaks of having a share in the district (*khushr fi 'l-Khasha'ah*), i.e. one is *mushtarik* 'sharing' in the cultivation of a piece of land.

Of late years the introduction of pump-irrigation on a large scale in Ḥaḍramawt has led to the modification of these very ancient and traditional forms of share-cropping contract to meet the new conditions imposed by the use and maintenance of these pumps. Another recent innovation in one or two places is the introduction of piped water from perennial streams, a type of project usually financed by Ḥaḍramīs who have made fortunes in Sa'ūdī Arabia.

The type of dispute that can arise in share-cropping contracts is in evidence in the two types of plea which I quote below from Saiyid Muḥsin b. Ja'far b. 'Alawī Bū Numaiy,[112] the first of these being a complaint preferred by the owner of the property to be irrigated and cultivated, against the peasant with whom he has contracted to execute the actual work. The second complaint is that wherein the peasant claims that the owner has not fulfilled his side of the contract, and where he demands immediate payment of what is due to him.

باب المساقاة

(١) صورة دَعوى المالك المساقاة

أن يقول زيد: أدّعى بأنى ساقيت عمرًا هذا على البستان الفلانى بجميع ما فيه من النخل على اختلاف انواعها، على أن عليه سقيها وتعهدها وتسوية سواقيها وإصلاح الحفر التى فى أثناء السواقى وتلقيحها وحفظ ثمرها وقطعها وغير ذلك مما فيه صلاحها، وله فى مقابلة عمله الثلث من الثمرة الحاصلة منها، وقد امتنع من ذلك، أو هرب، أو قصر فى عمله، وانا مطالبه بالوفاء بما التزمه من العمل، فمُرْه، أيها الحاكم، بوفاء ذلك.

(٢) صورة دعوى العامل بمقابلة عمله فى المساقاة

أن يقول عمرو: أدّعى ان زيدًا ساقانى على البستان الفلانى بجميع ما فيه من النخل على اختلاف انواعها، على أن علىّ سقيها وتعهدها وتسوية سواقيها وإصلاح حفرها وتلقيحها وحفظ ثمرها وقطعه وغير ذلك مما فيه صلاحها، ولى فى مقابلة عملى الثلث من الثمرة الحاصلة منها، وانا مطالب له بما شرط من الثمرة حالاً، وهو يلزمه وقد امتنع من ذلك، فمره، أيها الحاكم، بتسليمه الىّ.

[112] *Taḥṣīl al-da'āwī fī raf' al-shakāwī*, al-Mukallā, n.d. (but received in 1958), 21–2.

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At the fertilization of the palm trees I have already reported that certain songs are sung [113] though I had at that time no examples. Professor J. Robson has somewhere stated that it is believed that evil spirits attend the fecundation of the date-palm and the collection of the date-harvest in southern Arabia, so that the peasant going up the tree sings to scare away the Jinn.[114] In February 1954 in Saiwūn I heard a man in our garden singing as he climbed the tree to perform the *fukhṭah* or fertilization, the charming ditty,

يـا طُيور الخـَلا والصَيْـد والنـُوب
يا خـَيْر مطلوب

' O birds of the open country, game, and bees,
O what an excellent thing to ask'.

The allusion to birds has probably a significance that is at present unknown to me, but the reference to game at once brings the ritual Ḥaḍramī hunt to mind, and honey has properties next to magical.[115] Another ditty which I heard in Saiwūn seems, if it has been correctly given me, to be of rather unconventional form.[116]

وُآزْرَعْ يا زارِعْ
عَسَى مِنْ حُضُورَكْ
وَلا ضَار يَضورَكْ
يا آلله بِصَلاحَكْ
يا مَوْلَا الصَلاح
والكـَرَع فى جـُذورَكْ
وَسِّعْ نـُحـُورَكْ
والزَكاه والمعروفْ
والخـَيْر المَوْصوفْ
قِسْمِى وقِسْم الغـُرابْ
وبا فـَرارَهْ ما يِجيهْ
ولا يـَقْرُبْ حـَوَالِيهْ
وُآزْرَعْ يا زَارِعْ.

[113] *Prose and poetry*, preface, 37–8, mostly an ' ooooooo ' sound, with words appearing here and there.

[114] While I cannot positively affirm that this is also the case in Ḥaḍramawt it seems to me very likely.

[115] Its curative properties were praised by the Prophet and to this day these are highly esteemed.

[116] Neither of these two pieces seems to have a consistent metre.

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'Till, O husbandman.
May it be that you come [117]
With no harm to befall you.
O God, for your well-being,
O Lord of well-being,
The rain-water at your roots
Make wide your fronds.[118]
Charity and customary benefit,[119]
Outstanding prosperity
In which I and the crow have our shares.
May the worm Bā Farārah [120] not come to it,
Nor come anywhere near about it.
Till, O husbandman.'

It is to my regret that, at the time of taking down this ditty I thought the Arabic simple enough to dispense with detailed comment, if indeed that could have been given for it by the peasant. It now seems to me that this is almost a hymn to the palm tree, or an invocation to it to grant of its fruit, and to Allāh to protect it. This poem would then be further evidence in support of my contention that traces of palm-worship survive to this day in the folk memory of Ḥaḍramawt. Although I obtained this ditty in Saiwūn I was told at Ḥuraiḍah that it was also used there, so perhaps it is widely spread throughout the country.

Documents relating to property

Documents or deeds relating to the possession of property are known as *khuṭūṭ māl*. In pre-Protectorate days the Kathīrī sulṭāns used to take a fee of 10% or more of the price of houses and land for their signature to the transfer documents, but this is no longer charged. In general tribesmen with protection rights (*shirāḥah*) [121] over palm plantations used to exact a fee when one palm-owner disposed of his property to another party. In Tarīm when the owner of ground is not known it is called *arḍ majhūlah*, a term probably universal. I am inclined to consider it axiomatic that there is no inch of Arabia that is not owned by someone, however desert it may appear, and though we might be inclined to regard a piece of land which the Arab calls *arḍ majhūlah* as having no owners,

[117] I had thought the palm-cultivator to be addressing himself, but I now think he must be speaking to the palm tree. This has made me wonder if *ḥuḍūr-ak* could mean 'to ripen'. *Yā mawla 'l-ṣalāḥ* must, I think, be apostrophizing the palm tree, and it is reminiscent of the title given to saints, even unknown saints such as Mawlā Maṭar.

[118] *Gloss. daṭ., kara'* 'eau de pluie'. *Naḥr* according to Landberg, *Ḥaḍramoût*, 720, is 'couronne du palmier', but *nuḥūr* was explained to me as *sa'f*.

[119] For the *zakāt* see *Prose and poetry*, Ar. text, p. 24. By *ma'rūf*, the *ṭarḥah*, or small gift of dates to a beggar at the date-harvest may be meant.

[120] Bā Farārah, described as a *dūd tawkul al-kharīf*, a worm which eats the ripe dates.

[121] For a *maqāmah* on this institution see *Prose and poetry*, Ar. text, p. 16 seq. A dispute over *shirāḥah* figures in Muḥ. b. Hāshim, *Tārīkh al-dawlat al-Kathīrīyah*, Cairo, 1948, 134. *Māl* is stated by *al-Shāmil*, 175, to be used in Ḥaḍramī dialect in the sense of cultivated fields (*jurūb*).

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I feel that behind this term lies the Arabian conception that it is owned by someone even if the owners be unbeknown to us. I do not, however, propose to go into this subject though I think the sections on *iḥyā' al-mawāt* in Arabian law-books would probably enable us to form a true conception of how Arabians regard the holding of waste land.

During one of our sessions in Tarīm, Raḥaiyam dictated to me the following document which, though it relates to no particular holding, unless indeed it be he had some property of his own in mind, may be considered typical of property in palm trees. Though a holding of five palms may seem small, it must be recalled that some owners possess as little as one palm only or a share in a palm.

لفلان بن فلان خمس حُفَر نخل، حمراء وصَفَارِى، عند مَضْلَعَة مَتّاش، من ذلك دَوَّار حمراء أُنْهُر خمسه قِبْلى نخلة فلان ونَجْدى نخلة فلان وبَحْرِى فوُصِح (خالى) وشرقى عَيْن المَسِيله. وله من الحَيْد القبلى ثلاث حُفَر حمراء وصفارى، الأُولَى سُرَيِّعِى مثلوث شرقى حمراء المذكور ونجدى قِرَيْن فلان بن فلان وبحرى مَنْقَر فلان بن فلان وقبلى المسيله فوق الحيد ومع زار حيد شرقى السريّعى المذكور ونجدى خَلْعَة فلان وبحرى مدينى فلان بن فلان.

'So-and-so (*A*) owns five circular runnels [122] of palms, red date type and yellow date type,[123] at the Barrage of Mattāsh,[124] consisting of a multi-trunk palm [125] of the red date type with five stems,[126] west of So-and-so's (*B*) palm, north of So-and-so's (*C*) palm, south of an open (empty) piece of ground,[127] and east of the channel of the flood-bed.[128] Of the western palm plantation [129] he owns three circular runnels of red date type and yellow date type, the first of which is a *Suraiya'ī* [130] with three stems [131] east of the said red date type,

[122] See p. 61, n. 107.

[123] For these types see *Prose and poetry*, Ar. text, p. 128, v. 15.

[124] Mattāsh would be so called after one of the nine *fakhīdhahs* of Yāfi' which used to control Tarīm.

[125] A *dawwārah* is a palm with three or more trunks stemming from the root.

[126] *Nahr* (pl. *unhur*), syn. *judhū'*, trunks or stems of the palm; where a palm has several stems from one root these are known as *awlād*. It has occured to me that the word *anhār* in Baḥraq, 'Forms of plea', 11, may be another plural in this sense.

[127] *Fūṣiḥ* was said to mean an open piece of ground without *'ilb* trees or palms. Perhaps it is to be linked with *fasaḥ* in the *Gloss. daṭ.*

[128] The Masīlah is the flood-bed of the Wādī Ḥaḍramawt, which is very wide in places, the *'ain* seems to mean the channel in it where floods normally run.

[129] *Ḥaid* is palm-grove at the side of the Masīlah, cf. fig. 8. *Al-Ḥayāt al-sa'īdah*, 5, mentions Ḥaid Qāsim which one passes coming into Tarīm. *Qāsim* is apparently *maqāsim al-mā'*, a place where the flood-waters are distributed, not a proper name. In coastal Ḥaḍramawt a *ḥait* is a *bustān*, and I think that *ḥaid* in the sense of palm-grove is to be linked with this word, not with *ḥaid* in the sense of a mountain.

[130] *Prose and poetry*, Ar. text, p. 128, v. 14. A red variety becoming black, called 'swift' because it is the first date to ripen.

[131] I have not confirmed *mathlūth* in this meaning.

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north of the double-stemmed [132] palm tree of So-and-so (*D*), south of the tall single palm [133] of So-and-so (*E*), and west of the flood-bed above the palm plantation, along with a *Zār* [134] palm of a grove east of the said *Suraiya'ī*, north of the young fruit-bearing palm [135] of So-and-so (*F*), and west of the *Madīnī* [136] palm of So-and-so (*G*).'

In Saiwūn I was informed that a small group of palms is called *ḥailah*, but do not know if this term is used in other places, and there may be other technical names for groups of palms also.

Floods in Ḥaḍramawt

The list of floods *infra* has, unless otherwise stated, been based upon notices in *Tārīkh Shanbal* up to the year 905/1499–1500, some of the other authors quoted being from annotations to my edition, in preparation, of this chronicle. For the remainder of the tenth/sixteenth century, unless otherwise stated, the notices are derived from the chronicle of Bā Faqīh al-Shiḥrī. The list is defective in several respects—obviously not all of the great floods of the period have been chronicled, and many other MS sources, as for example *al-Sanā' al-bāhir*, and the *Mukātabāt* al-Ḥabīb 'Alī b. Ḥasan al-'Aṭṭās cited by *al-Ḥayāt al-sa'īdah*,[137] could supply data. Shanbal sometimes draws upon sources which know nothing of Ḥaḍramawt of the interior, and vice-versa. The dating of rains occurring at certain stars has been established from the *Ḥisāb al-Shibāmī*.[138]

It is surprising to discover that after so many destructive floods there is no evidence quoted of cultivated areas being abandoned, and the same localities appear to continue in cultivation. Were the notices in this list to be compared with the evidence on the ground it is just conceivable that the effect of some of the major floods of olden times could be assessed. Daw'an valley, doubtless because it is so narrow and takes the spill of so much of the Jōl, suffers recurrently from violent floods, as indeed it did in September 1954 when I was in

[132] *Prose and poetry*, Ar. text, p. 130, v. 30, a *qirain* is a palm with two stems from one root.

[133] A *manqar* is a tall single palm.

[134] *Prose and poetry*, Ar. text, p. 131, v. 41, the *zār* is a yellow type of date.

[135] The *khal'ah* (pl. *khilā'ah*) is a small young palm which has reached the fruit-bearing stage. Syn. *naqīl*. Bā Hārūn, MS cit., fol. 8r., speaks of a *saiyid* who had *khali' fi 'l-Maqṭa' taḥt Rawghah . . . idhā waqa' al-kharīf mā yukhallī aḥad yashraḥ khali'-ah*, i.e. palms in al-Maqṭa'(?) near Rawghah . . . when the ripe dates came he would not let anyone act as watchman over his palms. Raḥaiyam commenting on *Prose and poetry*, Ar. text, p. 163, stated that *khali'* is pl. of *khal'ih* ' palm '. *Khilā'ah*, *Prose and poetry*, Ar. text, p. 130, is the act of planting palms. Bā Hārūn, fol. 9v, contains the phrase *yaghris khil'ān*, the latter word also a pl. of *khal'ih*. A celebrated *saiyid* ancestor is known as Khāli' Qasam, i.e. the man who planted palms at Qasam village. Raḥaiyam told me that at Rawghah Satan became a watering ass to one of the *saiyids* and used to work on his *khal'ah*. This field where Satan worked is still known at Rawghah, lying by the mosque there.

[136] *Prose and poetry*, p. 128, v. 13, the *Madīnī*, said to originate from Medina, is a type much esteemed for its quality.

[137] *Al-Ḥayāt al-sa'īdah*, 18.

[138] cf. my ' Star-calendars and an almanac from south-west Arabia ', *Anthropos*, XLIX, 3–4, 1954, 434–5. The almanac in question has entries relating to flooding, but these apply to the Yemen.

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Ḥaḍramawt, but it never seems to be abandoned. There are many places where the fields have been turned into stony *wādī*-bottom, but perhaps the soil may be piled up in other places. Exceptionally heavy floods sometimes seem to drive up-stream as in 794/1391–2 when the waters of Wādī Khōn mounted some miles up-*wādī* to ʿĪnāt. The flood of 894/1488–9 is remarkable for rising up the mountain-side, i.e. above the termination of the scree line, and washing away threshing-floors placed there so as to be clear of this danger. Locusts in great number often follow the floods, a phenomenon that may be well known to the Desert Locust Survey.

For reasons I have not explored Ḥaḍramīs consider that the south wind is beneficial at times of flood, for a Tamīmī *rajaz* which I heard runs,

شارَهْ بِلا بَحْرِی کَما باب اَرتکب ما لُهْ قَوَام

ʿ Rains (and floods) without the *Baḥrī* wind,
Are like a door set up without supports ʾ.[139]

Preliminary list of rains and floods in Ḥaḍramawt, coast and interior

658/1259–60. Many houses destroyed by rain. (This reference may perhaps apply to the coastal area only.)

685/1286–7. Violent rain, tempestuous wind, high seas at Ẓufār. Crops ruined, many wells destroyed, and many (coastal ?) districts ruined.

721/1321–2. Famine in Wādī Ḥaḍramawt causing much death to man and beast, implying thereby a failure of rains.

725/1324–5. Rain at Ẓufār destroys houses, mosques, and gardens.

758/1356–7. Heavy rain in Wādī Ḥaḍramawt followed by locust swarms.

775/1373–4. Great flood in Wādī Dawʿan sweeps away the palms of Raḥbat Dawʿan entirely, carrying some palms with their crop as far as al-Kasar, clearly a summer flood.[140] The *Tārīkh Bā Sharāḥīl* chronicles a severe famine this year, perhaps a result of the flood, remarking on the high prices in Wādī Dawʿan.[141]

787/1385–6. Heavy rains, thunder and lightning at al-Shiḥr destroying houses and part of the town wall.

794/1391–2. General rains in the month of Rajab. From Shibām and its districts come great floods. Wādī Khōn floods and (its waters) mount to ʿĪnāt causing much destruction. Wādī Thibī floods, carrying off palms at al-Naqar (between Tarīm and Ḥuṣn Fallūqah). In this year there was great ease.

810/1407–8. Rain in areas in Ḥaḍramawt (Wādī) and al-Kasar results in low prices for commodities, i.e. millet, dates, and ghee.

811/1408–9. Commodity prices still lower, implying perhaps a continuation of good rains.

[139] *Qawām*, the supports or posts, the lintel being *kafāh*.

[140] *Al-Ḥayāt al-saʿīdah*, 15.

[141] For this author cf. ʿ Historians and historiography of Ḥaḍramawt ʾ, *BSOAS*, xxv, 2, 1962, 242, as also for Bā Sanjalah, *infra*.

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812/1409–10. General floods in all districts. A great flood comes from Ju'aimah (north of Shibām). This is followed by locusts.

823/1420–1. A pestilence in Ḥaḍramawt with great scarcities and much death from hunger, even cannibalism being alleged. This may indicate a failure of rains.

832/1428–9. In the star al-Dhirā' (14–26 January), and again at al-Ṣarfah (20 March–1 April) rain and floods at Shibām. (*Tārīkh Bā Sanjalah.*)

838/1434–5 or 839/1435–6. Rains in nearly every district which, in Daw'an, carried off many palms and destroyed fields (*aḥjāl*). (Bā Sanjalah.)

848/1444–5. After a period of high prices for commodities, al-Kasar and other places have rain in Kharīf (July–September).

853/1449–50. The barrage (*ḍamīr*) of Wādī Thibī was built up at the cost of Sulṭān 'Āmir of the Yemen, but a *sail* from the Wādī Thibī destroys it.[142]

860/1455–6. Heavy rain in all districts.

866/1461–2. Heavy general rain in Ḥaḍramawt (interior ?).

891/1486. All Ḥaḍramawt had rain with two great floods in the star al-Sarfah (20 March–1 April).

894/1488–9. A great flood in the star al-Iklīl (24 May–5 June) from al-Khamīlah (south of 'Amd) which was swelled by the flow from 'Ain, 'Amd, Daw'an, Sar, 'Idim, Thibī, etc. It destroyed threshing-floors (*aṣārī*), many palms, barrages (*maḍāli'*). It destroyed Qasam, Ribāṭ Āl al-Zubaidī, part of Bōr, then people got it under control. It rose about 10 cubits (say 15 feet) on the foot part (*safḥ*) of the mountains.[143] Locusts in quantity followed and their young (*dabā*).[144] The locusts ate the crop but its roots, from which a new crop would spring, remained, and the people seem to have done even better because of this. Bā Sanjalah adds that some of Masīlat Āl Bā Dhīb,[145] Bait Maslamah, and other places, perhaps Wādī al-Mukhainīq (but the MS is badly wormed at this point) were destroyed. Four years seem to have been spent in the repair of some places.

896/1490–1. Rains in Daw'an, al-Kasar, Wādī 'Amd and most of (interior ?) Ḥaḍramawt. The barrage (*'aqm*) [146] of Wādī Shibām was broken (Bā Sanjalah).

900/1494–5. A great flood in Daw'an destroys many palms and much land (Bā Sanjalah).

901/1495–6. In Jumādā II in the middle ten days there was rain in Shibām

[142] *Al-Ḥayāt al-sa'īdah*, 15, but in the following year Bā Sanjalah records rains in Ḥaḍramawt after much dearth, the MS unfortunately being wormed at this point so that it is not clear that rains had been short previously.

[143] cf. *Prose and poetry*, Ar. text, p. 129, *Fī safḥ Daw'an luh awṣār.* The *safḥ* is the point at which the mountain foot touches the level plain.

[144] Young of locusts, with wings about one inch long.

[145] The letters are undotted in the text ; my reading is conjectural.

[146] Perhaps this should be read *'uqam* with Landberg, *Ḥaḍramoût*, 660, deflectors. These would be the deflectors which lead the water into the fields as in pl. IV. Cf. the Aden paper *Ṣawt al-Janūb*, II, 30, 1963, العقمة عبارة عن سد طيني يقـام لتحويل مياه السيل.

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and ' the *wādīs* ', the flood entering the Shibām cemetery (west of the town (pl. II)) (Bā Sanjalah).

903/1497–8. A flood at Shibām and elsewhere on the first of the star Sa'd Bula' (25 July–6 August) (Bā Sanjalah).

905/1499–1500. In the star al-Haq'ah (1–14 December) Ḥaḍramawt had good rains (Bā Sanjalah).

929/1522–3. Rain and a great powerful wind called in al-Shiḥr *al-Shillī* [147] which caused destruction in al-Mishqāṣ, Ṣarīḥ/Ṣuraiḥ (?), and the Wādī (Ḥaḍramawt ?).

930/1523–4. Rain and wind but less than the *Shillī* of the previous year.

935/1528–9. In al-Shiḥr district at the close of Rabī' II and beginning of Jumādā I heavy rain destroying buildings in Shuḥair, Rawkab, etc.

939/1532–3. On 28 Shawwāl heavy rain and contrary winds in al-Shiḥr district destroy many palms. News arrives from Daw'an that a number of palms had been destroyed by floods the like of which had never been known, 4,000 being destroyed by Riḥāb alone. Their fields (*dhubūr*) had been so destroyed that only a few were left in Daw'an and only a few palms. The flood had risen to places to which it had never occurred to anyone it might attain.

945/1538–9. A famine in Ḥaḍramawt, Daw'an, and al-Shiḥr, from which one may imply a failure of rains.

948/1541–2. In Jumādā II prices became cheaper and rain (*ghaith wa-raḥmah*) was general, contrary to the high prices and famine of the preceding year (947).

968/1560–1. Famine in the Ḥaḍramawt and al-Shiḥr districts from Rajab to Ramaḍān (implying that the spring rains had failed).

970/1562–3. *Al-Nūr al-sāfir* [148] states that on 2 Shawwāl befell, ' the mighty great *sail* in Ḥaḍramawt, the like of which has never been heard, destroying many palms. The people of that province recall it to this day and date (events) by it. By them it is known as *Sail al-Iklīl* (24 May–5 June) '. After quoting a chronogram he continues, ' It is said that in ancient time there was a *sail* or two like it or approaching it, but there is no strength or power but in God '. Bā Faqīh al-Shiḥrī places the rain as falling on the last night of al-Iklīl, in al-Shiḥr district accompanied by a tempest lasting day and night, for some 48 hours. Then followed heavy rains, destroying buildings everywhere so that people fled from their houses into the streets. These disasters took place in Ḥaḍramawt (of the interior), al-Shiḥr and al-Mishqāṣ districts, even as far as Hurmūz in the Persian Gulf. It carried off people from Tarīm and al-Masfalah : some even appeared dead in the sea off Ḥairīj, but others escaped by clinging to palm-trunks. Countless palms were washed away and the cultivated valley land (*dhabr al-Masīlah*)

[147] T. A. Shumovsky, *Tri neizvestnye lotsii Aḥmada ibn Mādzhida, arabskogo lotsmana Vasko da Gamy*, Moscow, 1957, fol. 88r., l. 24, reads this word as *al-Shullī*, but in G. Ferrand, *Instructions nautiques*, Paris, 1921–8, I, 148 and elsewhere, *al-Shillī*.

[148] p. 274.

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of Wādī Bal-Ḥāf and its gardens [149] were turned into a *raḥbah*.[150] It swept away all the palms of al-Ghail al-Asfal and al-Ghail al-A'lā, the *'ilb* trees of al-Raidah and about 170 palms (or *'ilbs* ?) in Maifa', as well as the palms of Wādī Dhahabān of Shibām.[151] Al-Shiḥrī gives an account also of the shipping destroyed along the coast, adding that much verse had been composed about this mighty flood.[152]

979/1571–2. On 11 Jumādā II, heavy rains on al-Shiḥr district.

998/1589–90. *Al-Nūr al-sāfir* [153] chronicles a great flood in Wādī 'Idim at the star al-Thuraiyā (22 November–4 December) greater than *Sail al-Iklīl*; it is known as *Sail al-Thuraiyā*.

1049/1639–40. A flood is mentioned by 'Abdullāh b. Ja'far b. 'Alawī in the Wādī 'Idim,[154] called *al-sail al-mahīl* ' the terrible flood '.

1056/1646–7. According to *al-Ḥayāt al-sa'īdah* [155] the second flood of al-Iklīl took place some time before this date. It was less serious than the flood of 1124 (*infra*).

1124/1712–13. *Al-Ḥayāt al-sa'īdah* [156] places in this year *al-Sail al-Hamīm* in the star al-Ḥūt (1–13 October) or 16 Ramaḍān, a flood which swept away palms and *dhubūr*. Most of the destruction took place in Bait Muslimah and the Masīlah of 'Idim [157] and the alluvial earth of the *wādī*-bed (*baṭḥā'*) of Shibām, taking away palms from the latter. It also swept away many *'ilb* trees. It passed the *ghiyāḍ* (gardens) of al-Mishqāṣ district, eroding its *dhubūr*. It appears to be the same flood that is described by 'Abdullāh al-Ḥaddād [158] as destroying palms and huts about Tarīm. It then entered the village of al-Nukhr [159] at 'Īnāt and its cemeteries. It also destroyed most of the houses in Qasam and its Jāmi' mosque.[160] The text as quoted in *al-Ḥayāt* is a little obscure

[149] My MS has *ghait* for which *al-Ḥayāt al-sa'īdah*, 16 (based on Bā Faqīh al-Shiḥrī) has *ghiyāḍ*.

[150] A stony-bottomed flood-course, see p. 37 *supra*.

[151] In the Wādī Dhahabān is the *mawza'* of Shibām, of which Muḥ. b. Hāshim, *Tārīkh al-dawlat al-Kathīrīyah*, Cairo, 1948, 165, says, that it is *li-ṣadd miyāh al-suyūl wa-ḍabṭ-hā*. He adds *wa-'alaihi madār al-raiy fi 'l-maghāris ḥawla-hā*.

[152] Bā Hārūn, MS cit., story 253, refers to *Sail al-Iklīl* which carried off the palms of Ḥaḍramawt, and story 274, to the same flood which carried off the palms of al-Maqṭa' (?), houses in Qasam, etc. *Al-Rābiṭat al-'Alawīyah* (Batavia), II, 7, A.H. 1348, 275, in a note on floods in Ḥaḍramawt, alludes to this flood and the large number of palms destroyed by it in the Tarīm district, as well as some 20 mosques in the area.

[153] p. 458.

[154] Author of *Tadhkirat al-mutadhakkir fī-mā jarā min al-sail al-mutabaḥḥir*, Dār al-Kutub MS, no. 1257, a verse *maqāmah* of about 20 pages with *akhbār al-suyūl al-qadīmah*, and references to the Iklīl flood and *al-Sail al-Hamīm*.

[155] p. 17, but this statement may be incorrect.

[156] p. 16.

[157] Bait Muslimah is *qidā 'Idim* ' in 'Idim direction '.

[158] A celebrated eighteenth-century Ḥaḍramī *ṣūfī 'ālim*.

[159] A nukhrah (pl. nikhār) was defined by Raḥaiyam as, أرض ليّنة ينخرها الماء — يعني يفجّرها.

[160] In the Ahl Sahl Library, Tarīm, Muḥ. b. Zain b. 'Alawī b. Sumaiṭ, *Ghāyat al-qaṣd wa-'l-murād fī manāqib Shaikh al-'Ibād, 'Abdullāh b. 'Alawī b. Muḥ. al-Ḥaddād*, story 279, has an account of the great flood that swept away the Jāmi' mosque of 'Īnāt. For B. Sumaiṭ cf. ' Materials for South Arabian history, II ', *BSOAS*, XIII, 3, 1950, 582.

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at this point but it appears that a part of this district had the aspect of a bay of the sea. Al-Ḥaddād is quoted from another place as saying that this was a flood of a kind never previously known, worse even than the floods of al-Iklīl, affecting from Tarīm to ʿĪnāt and Qasam, destroying 10 mosques built alongside the Masīlah. It ran into Nukhr of ʿĪnāt into the cemetery and among the houses. It appears that the perennial streams (*ghail*) of Sāh were also heavily swollen.

1332/1913–14. 'In the star al-Fargh (18–30 September 1914), Upper Ḥaḍramawt drank, from Wādī ʿAmd and Dawʿan—to al-Ḥijail it reached, and Sadbah, Ḥawrah, ʿArḍ Bin Makhāshin the water reached, and may a good raining be hoped for .... Before that Rakhyah, ʿIrmā, Duhur, and al-Qiblī (the western area of Ḥaḍramawt) drank in the star Saʿd (al-Akhbiyah ? commencing 23 August ?) and al-Hajarain and al-Ghabar. Also they mentioned the harvesting when there was already there a first *mūsim* (flood-millet) crop .... ʿAwaḍ b. Saʿīd wrote this in al-Qaʿdah, 1332 '.[161]

Undated. *Sail Bin Ramaidān* is a flood mentioned by *al-Ḥayāt al-saʿīdah* [162] at which Raḥaiyam says he was present and upon which he composed a poem. It could therefore be dated from local information, but it does not appear to have been so important.

Appendix I

Irrigation terms in Oman

Oman is a territory so little known that it is interesting to note that irrigation there is undoubtedly as complex as it is in south-western Arabia, but the technical terms employed appear to be totally different from those to be met with in Ḥaḍramawt or the Yemen. The vocabulary *infra* is culled from al-Sālimī's *Jawhar al-niẓām* [163] but it is not to be assumed that it is more than a small portion of a vocabulary as extensive as that in any other part of Arabia.[164] Al-Sālimī defines a *wādī* in the following verse :

الوادى مجرى الماء فى السيول من جملة الشعاب والفحول

[161] My rendering of the Arabic is tentative. I found this passage in a MS in the library of the late Sulṭān ʿAlī b. Ṣalāḥ at al-Qaṭn. It would appear that when the first crop of millet was being harvested the floods caused the roots to sprout a second time.

فى نجم الفرغ عام ١٣٣٢ شربة علوا من وادى عمد ودوعن الى الحجيل بلغ وسدبه وحوره وعرض بن مخاشن بلغ الما فعسا قطر خير . . . وقد شربت قبل ذلك رخيه وعرما ودهر والقبلى فى نجم سعد والهجرين والغبر كذلك ذكروا اسراب وقد فيه باكر موسم . . . كتبه عوض بن سعيد فى القعده ١٣٣٢.

More correct spellings would of course be شربت, وعلوى, الصراب. ʿAwaḍ b. Saʿīd b. ʿAlī Bā Faḍl was secretary to Sulṭān ʿAlī.

[162] p. 18.

[163] II, 66, 293, 56, 50, 54, 50, 57, I, 293, II, 65, 58, 69, I, 43.

[164] Al-Sālimī demonstrates that an elaborate system of share-cropping obtains also in Oman, referring (II, 39) to the need for the hired man (*ajīr*) and partner (*sharīk*),

لاقتعاد الأرض والمياه
ليزرع الأرض ويسق الواهى
ويصلح الدروب والسواقى.

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The *shi'b*, he says, is *al-wādī al-ṣaghīr*, and *al-faḥl* is *al-wādī al-kabīr*. The *falaj* is defined by him as *tur'at al-mā' wa-'l-nahr al-ṣaghīr aw kull mā shaqq fi 'l-arḍ li-taqsīm al-mā'*. *Māt al-falaj* means that the water of the *falaj* has ceased to flow. The *sāqiyah*-channel he describes in the following lines :

وهى جوائز وحملان ترى فالجائز الذى يكون اكبرا
خمس اجايل حوى من أسفل وقيل اربعا حوى لا من على

والحملان مسلك تشعبا من جائز ليستى ما قد قربا
مسقاه دون المستى للجوائز هذا الذى يقال غير حائز
والقائد الساقية الكبيره وهى التى بها اعتماد الديره
وكل ما يمنع جرى الماء يخرجه الشاحب والافتاء

فالجدول الوعب على السواقى او غيرها من كل وعب باقى
وذلك الوعب يسمى دكّا فى عرف بعضنا لننفى الشكّا

Not all of these words are explained but definitions are given in certain cases only.

الجائز — نوع من السواقى وهو ما كان منها مشتركاً بين متعدد فى توزيع وستى ومنها الاجازة والحملان والقائد.

شحب الفلج — قشره بالمسحاة.

الوجين — شاطىء الساقية . . . وشاطئ الوادى. الوجين أيضًا الارض الغليظة الصلبة والعارض من الارض.

ظهر النهر Perhaps the bank of a water-channel ?
والسيل إن كسر ظهر النهر يجوز أن يستى بذاك الكسر.

السبية — الماء الجارى فى الساقية بعد رد النهر ويسمى أيضاً المجرى.

الاثر A quantity of water remaining in a stream.

الآد — نوبة الستى دوران الماء فى الفلج.

اجاله (ج. اجائل) A sort of *sāqiyah*-channel.

تصريج السواقى — طلاؤها بالصاروج وهو شىء يخلط بالنورة ويطلى بها الحياض ونحوها.

الثجّ/ثجّ — السَيَلاَن.

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Appendix II

Additional irrigation terms in Ḥaḍramawt [165]

(1) Classical terms still in current use :

جُرُف, defined as موضع اثر السيل فى الوادى.

ريد (coll. رَيْدَه) defined as نواحى الوادى لمحدده.

شيّد داره, to plaster (with lime, *jiṣṣ*) his house.

صنبور holes of a tank (*ḥawḍ*).

قلت defined as رَصَفَة, and as,[166] الماء العِدّ الدائم يكون فى رؤس الأودية غالبًا.

كَبَسَ, of a channel (*qanāt*), to fill it with earth. In Oman also, كبس means السيل فى الأفلاج الطمّ والامتلآء بالتراب.[167]

مجهورة, a well when its water is exhausted.

(2) Modern terms :

قَيْد (Wādī 'Amd), a name given to a pillar, possibly the end of a ruined deflector, for *qaid* in Dathīnah means ' digue '.[168]

مِجْفَا (Saiwūn), a *sawm* or bund.

مِدْمَار (Saiwūn) supporting bank at foot of wall (fig. 11).

مَوْطَا (Saiwūn), a wide low *sawm*.

Fig. 11. The *midmār* or supporting piece at foot of a clay wall.

The following are from Sa'īd of Upper 'Awlaqī territory :

بِدّ (pl. بِداد), a channel. Cf. *al-Shāmil*,[169] الجدول والساقية المتفرعة من الكبيرة.

حَبَط piece of uncultivated land near a field.

شَبَب piece of uncultivated land in a field.

غَبَرَه spring with little water.[170]

مَرِيرَه واوثان low dividing *sawm* between two shares in a single *widin* (field) with land boundary marks.

الحامِل حق الوِدِن a *sawm* or bund.

[165] *Al-Lughat al-dārijah*, 169 seq.
[166] *Al-Shāmil*, 165.
[167] *Jawhar al-niẓām*, I, 302.
[168] *Gloss. daṭ.*, 1416.
[169] *Al-Shāmil*, 175.
[170] *Al-Shāmil*, 186.

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مِسْمَار means a furrow (*tilm*). I have noted, but without an explanation, the phrase مسمار بطون.

مَشْصَن (pl. مشاصن), ' espèce de digue '.[171]

In Sa'īd the local experts who go out to decide in land and water cases are known as *'urrāf*.

Appendix III

While in Johore in August 1963, through Saiyid Ṭāhir b. 'Alawī's courtesy I consulted more of his late father's *Kitāb al-Shāmil* than was hitherto available to me. There (pp. 214 and 224) a most curious account is given as to how the Bedouin of western Ḥaḍramawt seek rain from the celebrated 'Amūdī saint, Shaikh Sa'īd b. 'Īsā (a photograph of whose tomb appears in *BSOAS*, XIII, 2, 1950, opp. 281), a ceremony so essentially pagan that it might almost serve as commentary to certain pre-Islamic inscriptions. The following summary version may throw some light on ancient rites of petition for rain.

In the *Kharf* season, the time of rain, the Daiyin, Mashājir, Bā 'Ubaid, and other near-by tribes come in succession on a visitation to Shaikh Sa'īd at Qaidūn on *Na'ā'im*, i.e. about 2 July, to ask for rain for their country. It is their custom, on arriving at the top of the Jōl overlooking Qaidūn on the Thursday evening, to shout, *Lā ilāha illa 'llāh* ! (*yuhallilūn*), saying, *'Umūm, 'umūm, yā Shaikh Sa'īd* ! By this phrase they mean that the saint should give them general floods and rain in all their valleys (*shi'āb*), and the chronicles mentioned above (pp. 68–72), do actually make an entry from time to time of ' general rain '. (One says in colloquial Arabic, *fi sahn 'umūm al-raḥmah* ' in expectation of general rain '.) Then they descend the *'aqabah*, chanting *zāmils* with verses describing their travel and the long distance they have come to perform the visitation to Shaikh Sa'īd because their land is suffering from drought, and ' it would be shameful of you were we to return without a miracle ' (*'ār 'alaik idh raja'nā bi-lā karāmah*). In composing these *zāmils* the poets play an important part in the ceremony.

On arriving at the foot of the mountain the Bedouin proceed to the tomb of Shaikh Sa'īd and circumambulate the wooden ark-like cover of the grave (*tābūt*). Some bring ghee which they pour on the *tābūt*, and others even jump up on top of the *tābūt* itself to pour the ghee on it. They also circumambulate the other *tābūts* at the tomb, all the time chanting *zāmils*. Their votive offerings of sheep, money, or grain, they deliver to the *khaṭīb*, i.e. the *qā'im* of the Bā Rāsain tribe who are (hereditary) *khaṭībs* of the *Jāmi'* mosque ; (these latter also send out messengers at appropriate times to collect tithes (*'ushūr/zakāt*) from the tribes). When they have made the visitation they enter the mosque chanting *zāmils*, and, ascending the minaret, they cry out, *'Umūm, 'umūm,*

[171] So in *Gloss. dat.*, with fuller explanation.

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yā Shaikh Sa'īd! So they continue, without resting, all day and night of Friday, returning to their countries on the Saturday. The *khaṭīb* entertains them on the night of their arrival.

If several years pass without rain or they think Shaikh Sa'īd is reproaching them, they bring an *'aqīrah*, i.e. a cow or camel in procession with *zāmils* to the door that leads to the Shaikh's tomb, where they hock it and cut its throat, shouting, *Yā Shaikh Sa'īd, baḥr-ak naṭlub baḥr-ak*! By this they mean, *baḥr burhān-ak*. This might be rendered as, 'We want the ocean (-like extent) of your influence and miracles'. Then they drag the *'aqīrah* away to a house, and lock the door, those persons eager for meat falling on with their knives and, with clamour and menaces they cut it up, some coming away pleased with a large piece, but others disappointed, the largest share in any case going to the prominent people of the village. If there is a lot of meat they prepare it, dry it, and keep it for the coming days. The tribes may bring quite a number of *'aqā'ir*, and the author comments that on a certain occasion they brought *'aqā'ir* to Shaikh Sa'īd to petition him for victory over their foes the Ḥālikah.

It might be commented that this sacrifice of the *'aqīrah* is a method of putting a compulsion on a tribesman to take a certain action in aid of the man who offers it, and in this case the Bedouin are, as it were, trying to place Shaikh Sa'īd in a position where he must help them. Needless to say, Saiyid 'Alawī b. Ṭāhir strongly disapproves this practice, and indeed I should not be surprised to find that nowadays it is discontinued. Other vestiges of pagan belief with regard to petitioning for rain can be found in the sections on *istisqā'* in the Ḥaḍramī collections of *fatāwā* such as the *Bughyat al-mustarshidīn*.

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